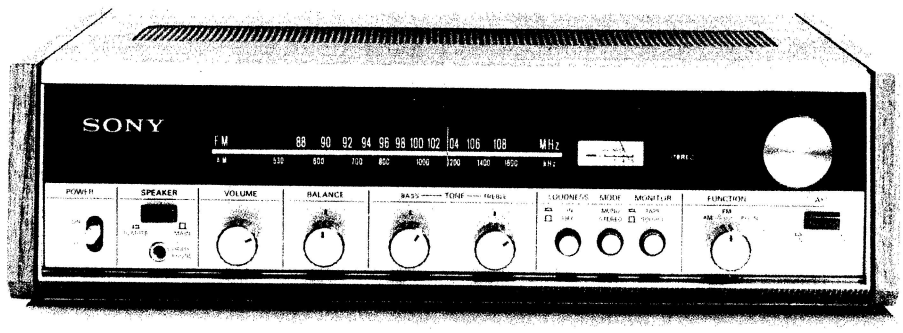
STR-230A

General Export, AEP and Canada Model

FM STEREO/FM-AM RECEIVER



SONY®

SERVICE MANUAL

STR-230A

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SERVICING NOTES

1. Note that the safety regulation requires all the connection points; where more than 30 volts ac is supplied such as power switch, ac outlet, should perform wrap-around joint as shown in Fig. A .

2. In the power amplifier board, all the components as listed below should be stand off from the surface of printed circuit board by using insulating tube to meet the safety regulation as shown in Fig. B.

   Diodes: D501, D502

   Resistors: R524, R525, R714, R715, R814, R815

3. When performing electrical check or replacement of some component on preamplifier/power supply board without removing the board, remove the dial lamp shade by straighten the tab as shown in Fig. C.

4. In this set, "wire-wrap" connections are employed as shown in Fig. D. In case a wire breaks, simply solder the lead wire directly to the terminal post.
   Wire-wrap connection cannot be properly made by hand.
   Care should be taken not to cut too deep when removing the insulation from wire.
   Even the slightest nick in the copper wire will weaken the wire enough to eventually cause a break at that point. Use a soldering iron to remove the insulation.

5. In the power amplifier, the thermistor Th801 (Th701) and posistor Po801 (Po701) are fixed to the R814 (R714) and R815 (R715) (series resistors of power transistors) respectively with contact cement ensuring the overload protection of power transistors as shown in Fig. E. When replacing any of these components, mount them precisely as before.

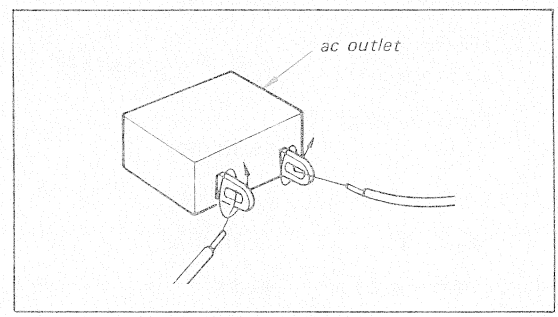


Fig. A Wrap-around joint

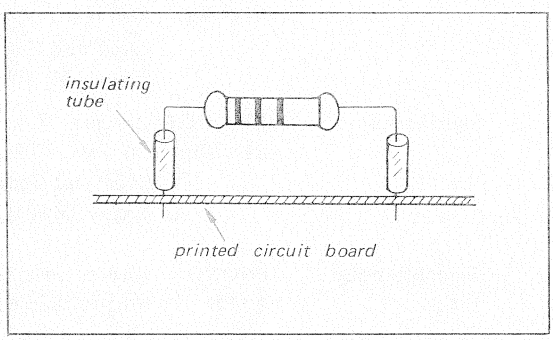


Fig. B Stand off component

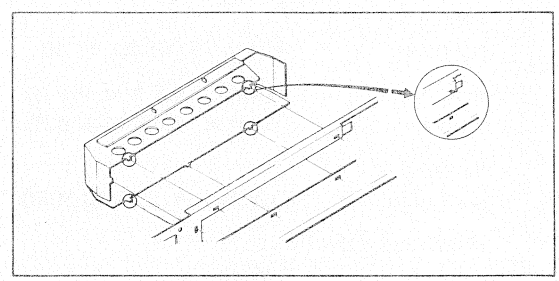


Fig. C. Dial lamp shade removal

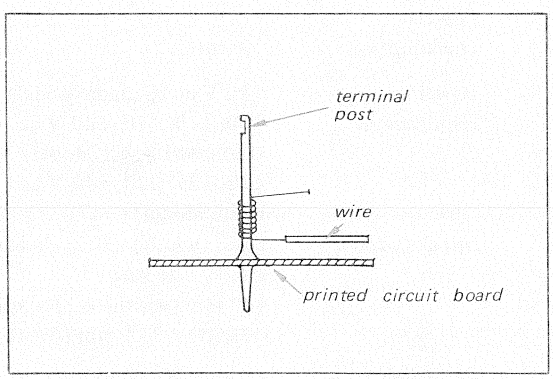


Fig. D "Wire-wrap" connection

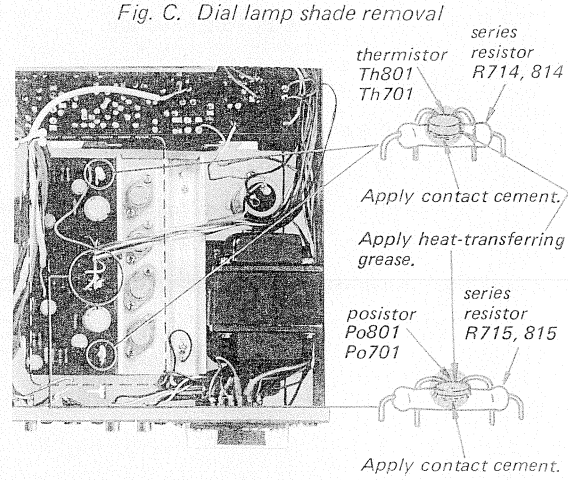


Fig. E Thermistor and posistor installation

STR-230A

SECTION 1

TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the STR-230A are listed in Table 1-1.

TABLE 1-1. STR-230A TECHNICAL SPECIFICATIONS

Fm Tuner Section

Antenna:	300 ohms balanced
Frequency range:	87.5 to 108 MHz
Intermediate frequency:	10.7 MHz
Usable sensitivity:	2.2 μV (S/N = 30 dB)
Signal-to-noise ratio:	65 dB, IHF
Capture ratio:	4 dB, IHF
Selectivity:	35 dB, IHF
Image rejection:	40 dB
I-f rejection:	90 dB
A-m suppression:	45 dB
Frequency response:	20 to 15,000 Hz ±3 dB
Harmonic distortion:	Mono: 0.5 % at 400 Hz Stereo: 1.0 % at 400 Hz
Fm-stereo separation:	Greater than 35 dB at 400 Hz
19-kHz, 38-kHz suppression:	45 dB

A-m Tuner Section

Frequency range:	530 to 1,605 kHz
Intermediate frequency:	455 kHz
Sensitivity:	48 dB/m, built-in antenna 20 μV, external antenna
Signal-to-noise ratio:	50 dB
Image rejection:	40 dB at 600 kHz 35 dB at 1,400 kHz
I-f rejection:	40 dB at 1,000 kHz
Harmonic distortion:	0.8 %

Audio Amplifier Section

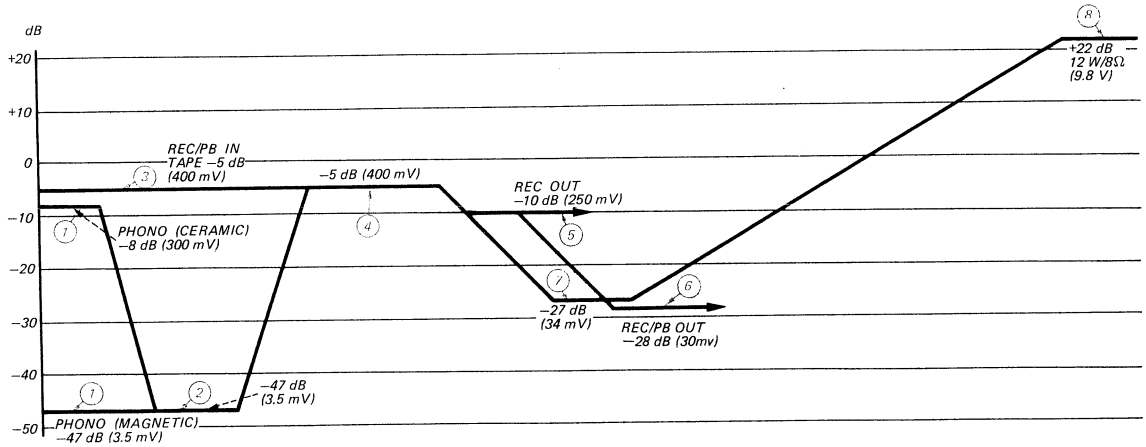
Music power output: (EIA)	40 watts, both channels operating, 8 ohms.
Rated power:	12 W + 12 W, 8 ohms
Harmonic distortion:	Less than 5.0 % at 1 kHz at rated output
Frequency response:	TAPE: } 30 Hz to 50 kHz (± 3 dB) at 1-watt output REC/PB: } (AEP and General Export Model only)
Input sensitivity and impedance:	PHONO: 3.5 mV 47 k ohms (MAGNETIC) 300 mV 3.6 M ohms (CERAMIC) TAPE: 400 mV 100 k ohms REC/PB: 400 mV 100 k ohms (AEP and General Export Model only)
Signal output:	REC OUT: 250 mV 10 k ohms REC/PB: 30 mV 80 k ohms (AEP and General Export Model only)
Signal-to-noise ratio:	PHONO: greater than 60 dB TAPE: greater than 65 dB
Tone controls:	BASS: ± 10 dB at 100 Hz TREBLE: ± 10 dB at 10 kHz

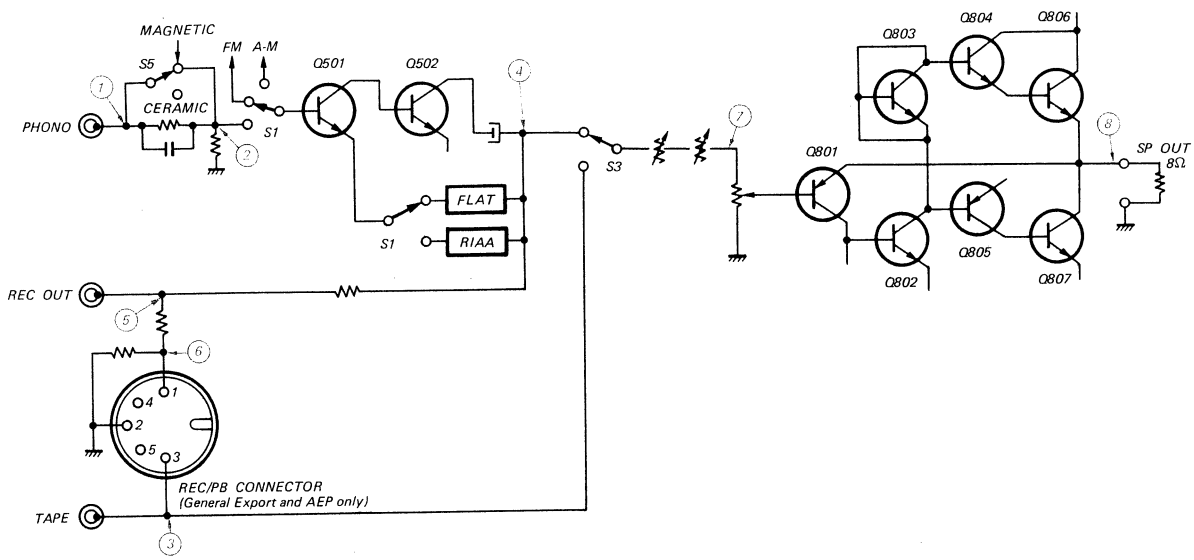
General

Power consumption:	70 watts
Power requirement:	120 V ac (Canada Model) 100, 120, 220, 240 V ac (General Export Model) 110, 127, 220, 240 V ac (AEP Model)
Dimensions:	16½" (width) x 4½" (height) x 12½" (depth) 420 mm (width) x 116 mm (height) x 312 mm (depth)
Net weight:	13 lb 14 oz (6.3 kg)
Shipping weight:	18 lb 1 oz (8.2 kg)

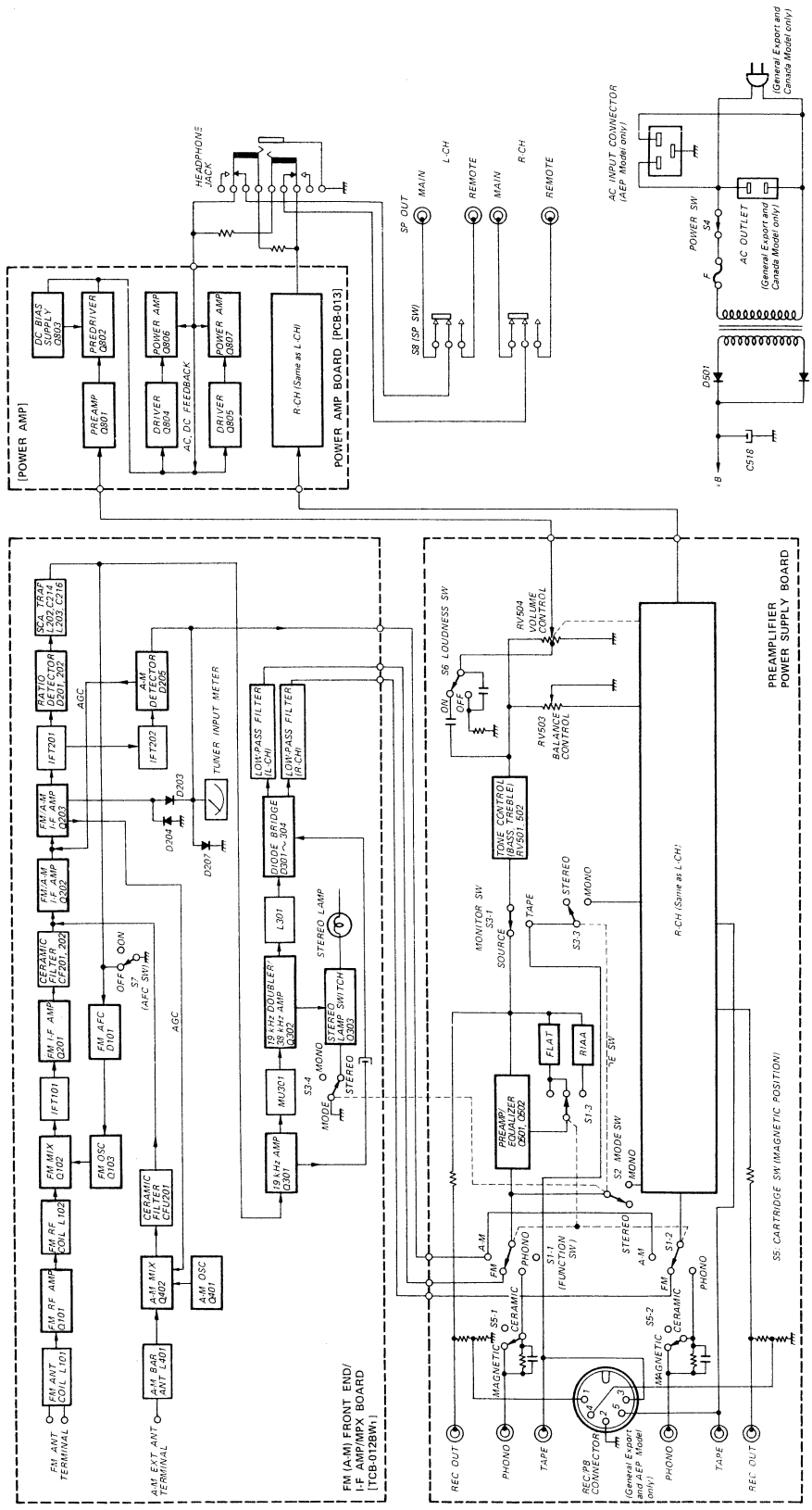
1-2. LEVEL DIAGRAM

Note: Signal voltages are measured with ac VTVM and expressed in dB referred to 0.775 V, 1 kHz.





1-3. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

Unplug the ac power cord before starting any disassembly or replacement procedures.

2-1. TOOLS REQUIRED

The following tools are required to perform disassembly and replacement procedures on the STR-230A.

Screwdriver, Phillips-head
Screwdriver, 4-inch cabinet
Wrench, 6-inch adjustable
Cardboard, 3-inch-square
Protective pad
Cellophane tape
Soldering iron, 40 to 150 watts
Cement, contact
Cement solvent
Diagonal cutters
Pliers, long-nose
Soldering tool, wire-brush end
Tweezers, 6-inch
Tape, electrical
Silicone grease
Nutdriver, 3-mm
Solder, rosin-core

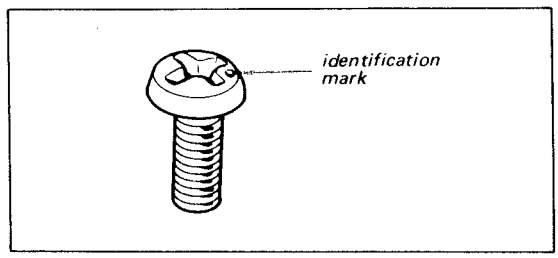


Fig. 2-1. ISO screw

2-2. HARDWARE IDENTIFICATION GUIDE

The following chart will help you to decipher the hardware codes given in this service manual.

Note: All screws in the STR-230A are manufactured to the specifications of International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable because ISO screws have a different number of threads per mm compared to the old ones. The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

Hardware Nomenclature

P – Pan Head Screw
PS – Pan Head Screw with Spring Washer
K – Flat Countersunk Head Screw
B – Binding Head Screw
RK – Oval Countersunk Head Screw
T – Truss Head Screw
R – Round Head Screw
F – Flat Fillister Head Screw
SC – Set Screw
E – Retaining Ring (E Washer)

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

Type of Slot
⊕ P 3x10
Length in mm (L)
Diameter in mm (D)
Type of Head

2-3. WOODEN CASE REMOVAL

1. Remove the eight screws and the two self-tapping screws shown in Fig. 2-2.
2. Push out the receiver unit in the direction shown in Fig. 2-2.

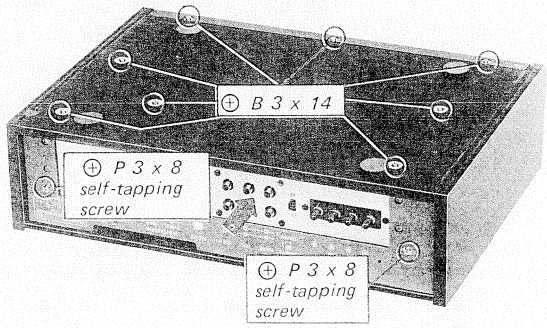


Fig. 2-2. Wooden case removal

2-4. FRONT PANEL REMOVAL

1. Remove the receiver unit from the wooden case as described in Procedure 2-3.
2. Pull off the six control knobs (VOLUME, BALANCE, TREBLE, BASS, FUNCTION and Tuning).
3. Remove the two self-tapping screws and the two nuts shown in Fig. 2-3.

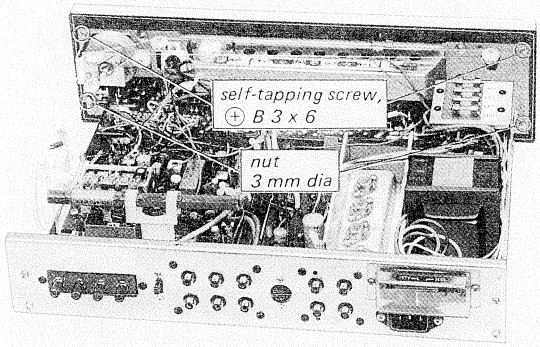


Fig. 2-3. Front panel removal

2-5. DIAL-CORD RESTRINGING

Preparation

1. Remove the wooden case as described in Procedure 2-3.
2. Cut a 63-inch (1,600 mm) length of 1/64 inch (0.3 mm) diameter dial cord.
3. Tie the end of the cord to a spring as shown in Fig. 2-4.
4. Rotate the tuning-capacitor drive drum fully counterclockwise (maximum capacitance position).

Procedure

While referring to Fig. 2-6 proceed as follows:

1. Hook the spring to one hole of the drive drum as shown in Fig. 2-5, and then squeeze it.
2. Run the cord through the slot in the rim of the drum and wrap a counterclockwise turn in the inner side groove. See Fig. 2-7.

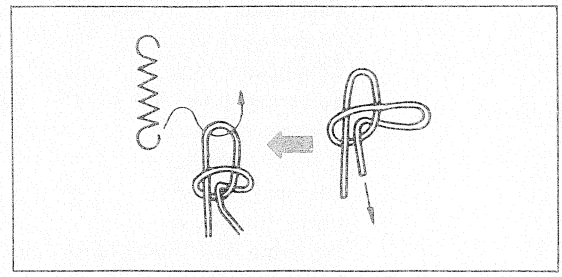


Fig. 2-4. Tying square knot in the coil spring

3. Run the cord over pulleys "A", "B", "C", "D", and then wrap three clockwise turns around the tuning shaft.
4. Run the cord over pulley "E" and then wrap half turn around the drum from outer groove to inner groove as shown in Fig. 2-6 and Fig. 2-7.
5. Pass the doubled end of the cord through the eyelet (See Fig. 2-8), then hook it to the spring as shown in Fig. 2-9.
6. Tighten the cord, then squeeze the eyelet so that the spring is under tension.
   Make a knot in the cord end to keep it from slipping out of the eyelet. See Fig. 2-8.
7. After completing the dial-cord stringing, make sure that the tuning system works properly. Apply a drop of contact cement to the knots. Perform the mechanical dial calibration.

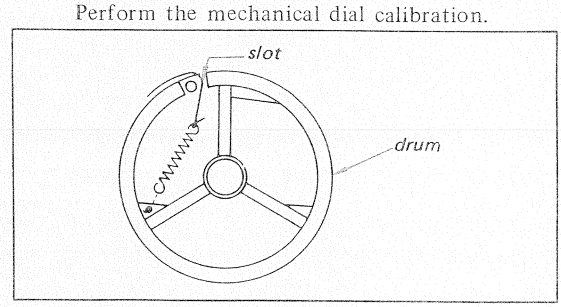


Fig. 2-5. Coil spring installation

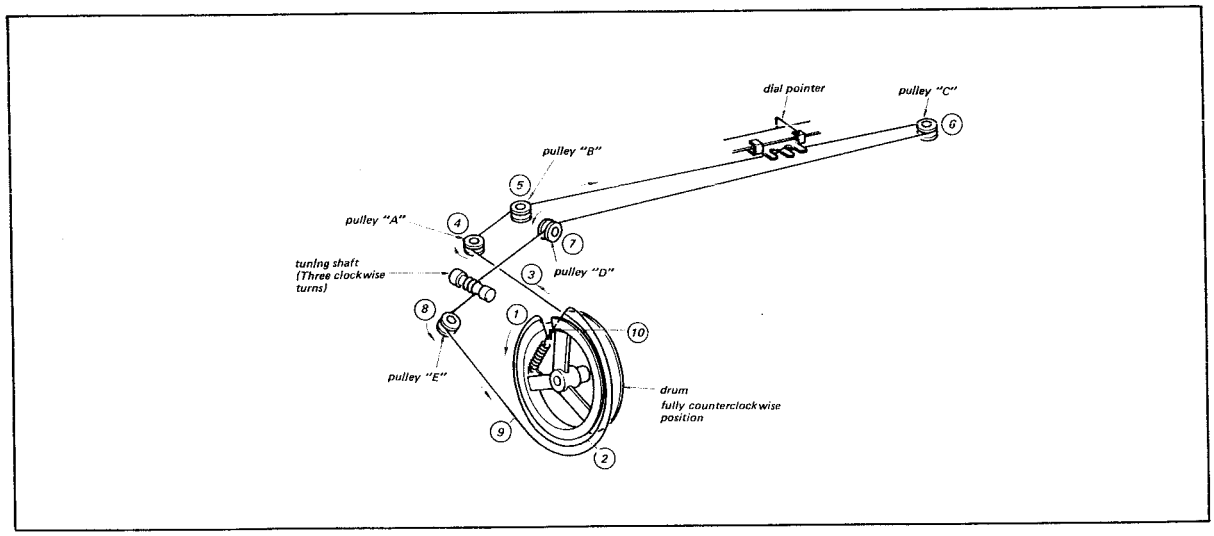


Fig. 2-6. Dial cord stringing

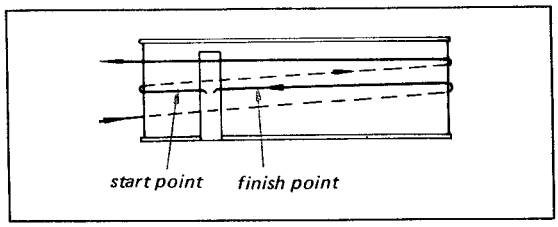


Fig. 2-7. Wrapping the dial cord

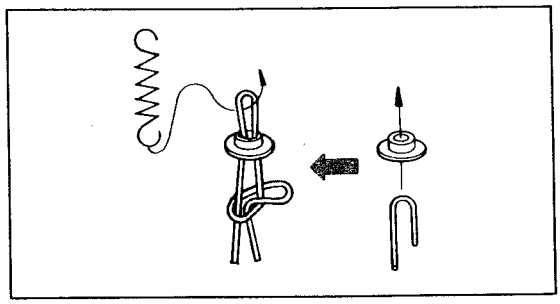


Fig. 2-8. Detail of dial cord finish

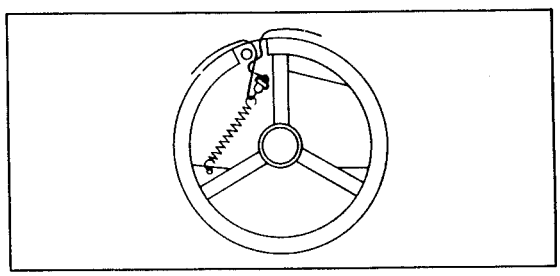


Fig. 2-9. End of dial cord stringing

2-6. MECHANICAL DIAL CALIBRATION

Note: This is required after replacing the dial cord.

1. Put the dial pointer on the cord as shown in Fig. 2-10, and move it to a position where the pointer coincides with the 530 kHz mark on the dial scale in the front subchassis as shown in Fig. 2-11, when the tuning capacitor is set to the maximum capacitance position.

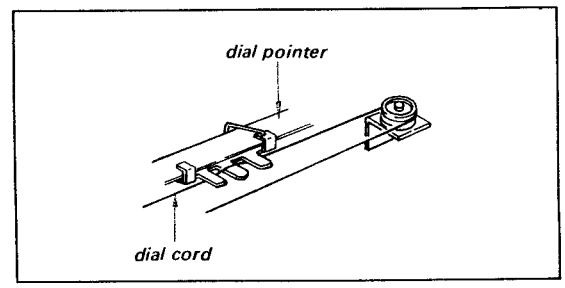


Fig. 2-10. Dial pointer installation

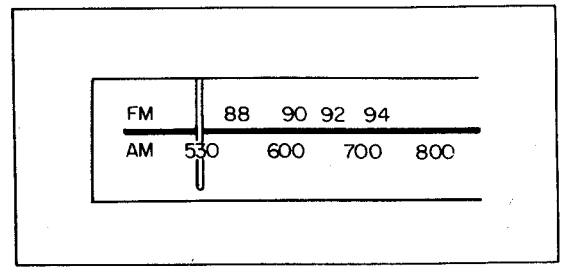


Fig. 2-11. Mechanical dial calibration

2-7. DIAL LAMP REPLACEMENT

1. Straighten the tab of the dial lamp shade to permit to removal of 3-p lamp holder as shown in Fig. 2-13. This frees dial lamp holder.
2. Remove the defective dial lamp, and then install the new one.

2-8. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY NYLON RIVETS

1. Remove the nylon rivets securing the defective component by pushing its end with a tweezers as shown in Fig. 2-13.
2. Remove the defective component and then install a new one.
3. To reinstall the rivet, insert the flared part into the opening first, and then push the head as far as it goes as shown in Fig. 2-14.

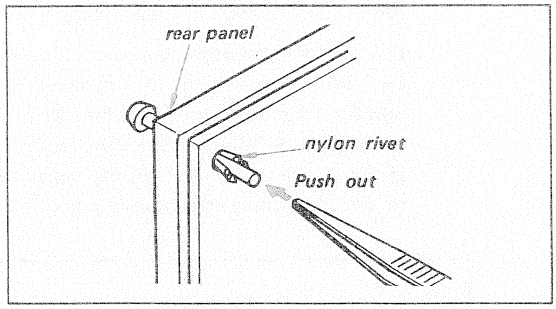


Fig. 2-12. Nylon rivet removal

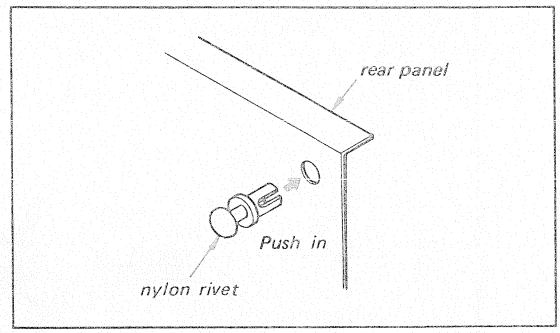


Fig. 2-14. Nylon rivet replacement

2-9. SWITCH AND CONTROL REPLACEMENT

Preparation

1. Remove the front panel as described in Procedure 2-4.
2. Fasten the dial cord to the drum or pulleys with cellophane tape.

Procedure

1. Remove the five self-tapping screws securing the front subchassis to the chassis as shown in Fig. 2-15.
   Remove the two self-tapping screws (⊕B 3 x 6) securing the fuse holder bracket to the chassis as shown in Fig. 2-16 (AEP Model only).
   This frees front subchassis as shown in Fig. 2-17.
2. Remove all the hex nuts and screws securing switches or controls to the front subchassis.
3. With a soldering iron having a solder-sucking tip, clean the solder from each lug of the defective switch or control and the printed circuit board.

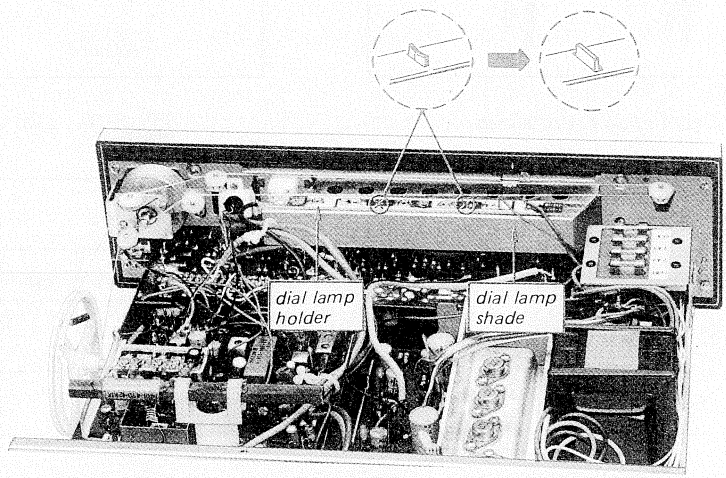


Fig. 2-13. Dial lamp replacement

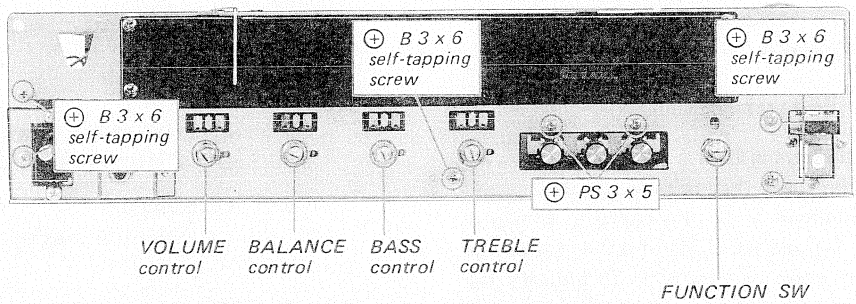

⊕ B 3 x 6 self-tapping screw
⊕ B 3 x 6 self-tapping screw
⊕ B 3 x 6 self-tapping screw
⊕ PS 3 x 5
VOLUME control
BALANCE control
BASS control
TREBLE control
FUNCTION SW

Fig. 2-15. Switch and control replacement

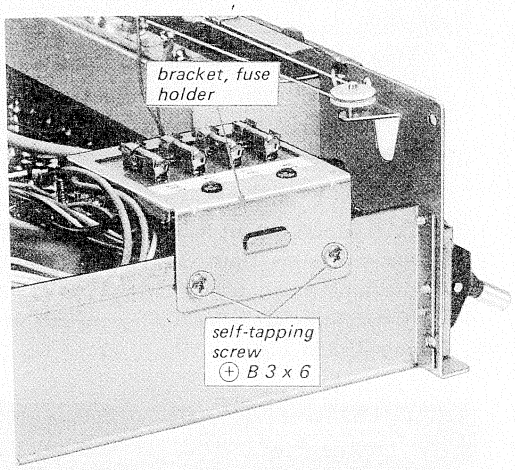


Fig. 2-16. Fuse holder bracket removal

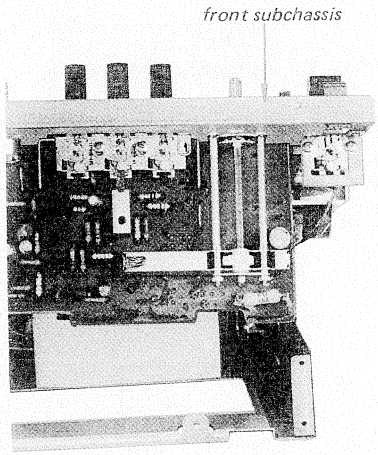
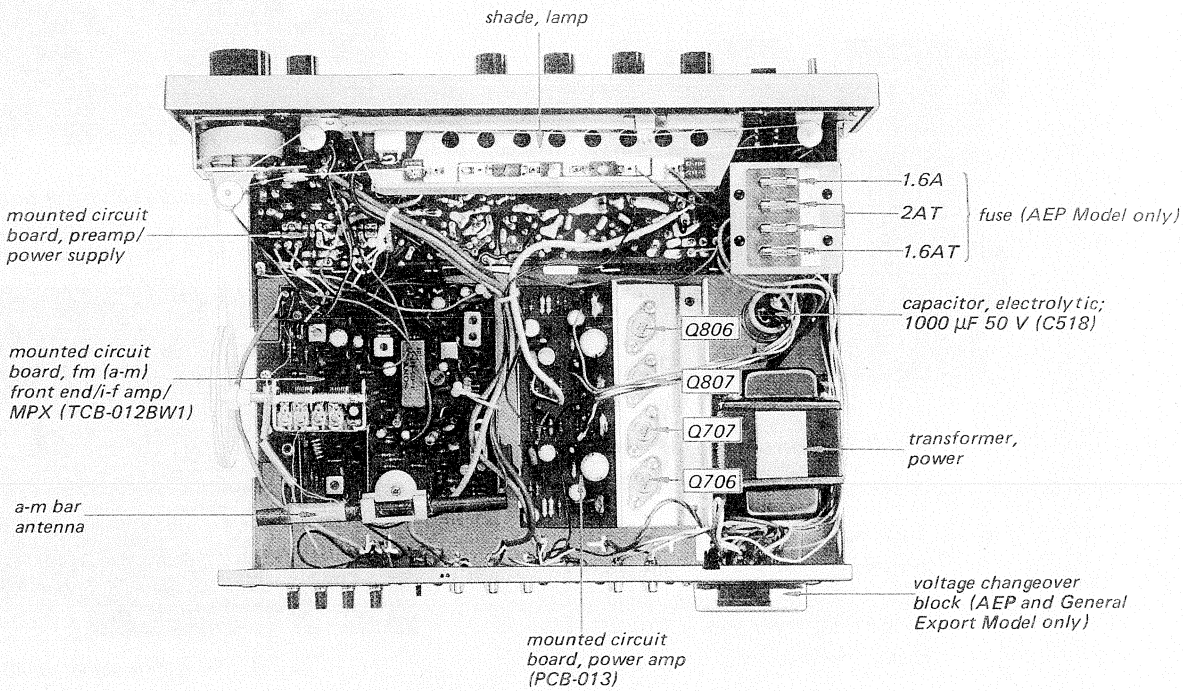


Fig. 2-17. Front subchassis removal

2-10. CHASSIS LAYOUT



SECTION 3

ALIGNMENT AND ADJUSTMENT PROCEDURES

3-1. FM I-F AND DISCRIMINATOR ALIGNMENT

CAUTION

The ceramic filters in the fm i-f circuit are selected according to their specified center frequencies and color coded as shown in Fig. 3-1 and listed in Table 3-1. Check the color code of the filters to identify the same center frequency when replacing any of these filters.

TABLE 3-1.
FM I-F CERAMIC FILTERS

Part No.	*Color*	*Specified Center Freq.*
1-403-562-11	red	10.70 MHz
1-403-562-21	black	10.66 MHz
1-403-562-31	white	10.74 MHz
1-403-562-41	green	10.62 MHz
1-403-562-51	yellow	10.78 MHz

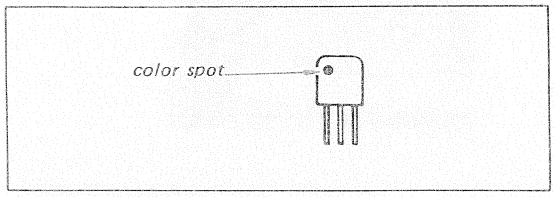


Fig. 3-1. Color dot on ceramic filter

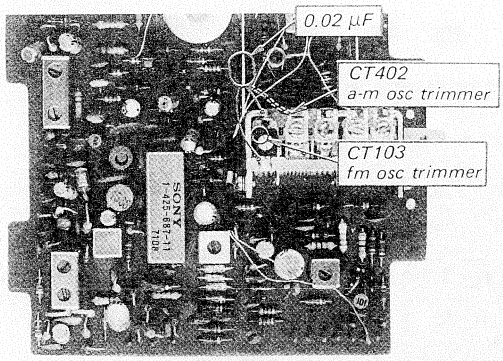


Fig. 3-2. Interruption of fm or a-m local oscillator operation

Note: Local oscillator should be killed when performing this alignment. To stop the local oscillator's operation, shunt the oscillator capacitor with a 0.02 μF capacitor. See Fig. 3-2.

Signal Generator Alignment

Test Equipment Required

1. Standard signal generator which can generate a 10.7 MHz a-m/fm signal.
2. Oscilloscope
   Vertical sensitivity . . . . . .100 mV/cm minimum
3. Alignment tools

Preparation

1. Connect the input cable of the oscilloscope with alligator clips to C217 and ground on the fm (a-m) front end/i-f amp/MPX board, and solder a 0.02 μF capacitor across these clips, as shown in Fig. 3-3.
2. Connect the output cable of the generator across CV102 on fm (a-m) front end/i-f amp/MPX board. Use alligator clips and make the connection through a 0.02 μF coupling capacitor as shown in Fig. 3-4.

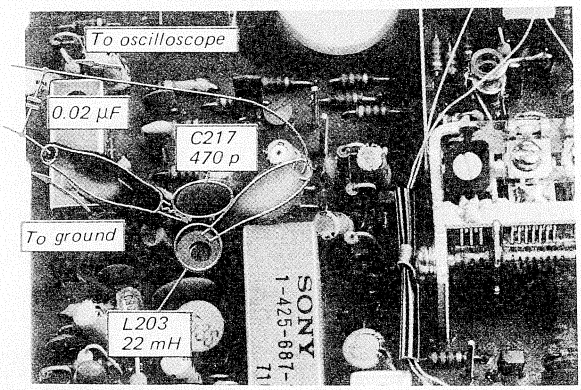


Fig. 3-3. Fm discriminator output connection

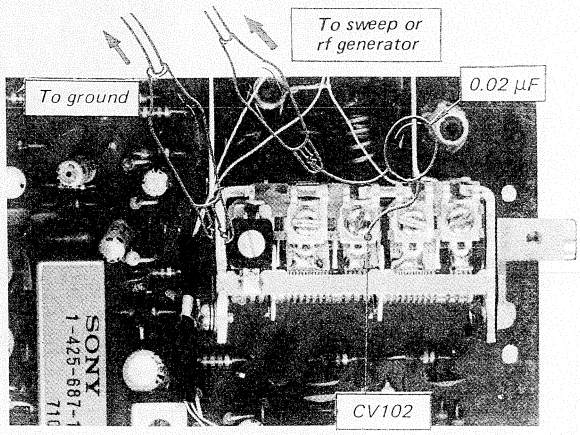


Fig. 3-4. 10.7 MHz signal injection

Procedure

1. With the equipment connected as shown in Fig. 3-5, set the signal-generator's controls as follows:

   Frequency..... Specified frequency of ceramic filter. See Table 3-1.
   Modulation..... Fm, 400 Hz, 100 % (75 kHz)
   Output level..... 1,000 μV (60 dB)

2. Set the receiver's controls as follows:

   FUNCTION switch... FM
   VOLUME control.... Minimum

3. Adjust the signal generator's frequency slightly to obtain a maximum output, and then change the signal generator's modulation to a-m, 400 Hz 30 %.

4. If the discriminator transformer is not aligned correctly, 400-Hz ripple will be observed as shown in Fig. 3-6.

5. Turn the secondary side core (green) of discriminator transformer IFT201 (see Fig. 3-11) with an alignment tool to obtain a minimum indication on the oscilloscope as shown in Fig. 3-6.

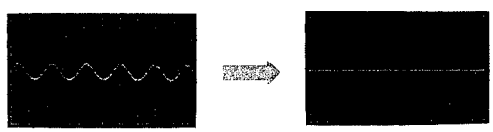


Fig. 3-6. Fm discriminator alignment output response

Note: Turn the core carefully and slowly because the output appearing on the oscilloscope jumps up and down when turning the core. This might cause difficulty in determining the point of minimum output.
Also, at both extreme positions of the top core, decreased output will be observed. The real null point should be obtained in the middle of the core thread length, and maximum output occurs at each side of the true null point.

6. Change the signal generator's modulation to fm, 400 Hz 100 % (75 kHz).

7. Turn the core of fm IFT101 and primary side core (brown) of discriminator transformer IFT201 (see Fig. 3-11), to obtain the maximum output.

3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Note: Before starting this alignment, the fm i-f and discriminator alignment should be performed.

Test Equipment Required

1. Standard fm signal generator
2. Ac VTVM
3. Alignment tools

Preparation

1. Connect the equipment as shown in Fig. 3-7.
2. Set the receiver's controls as follows:

   FUNCTION switch..... FM
   VOLUME control..... Minimum

3. Set the AFC switch to OFF position.

Signal Generator Alignment

Follow the procedures given in Table 3-2 when performing this alignment with an fm signal generator. Be sure that the dial is mechanically calibrated.

Off-the-Air Signal Alignment

Accurate dial calibration and a frequency-coverage test can also be performed by utilizing off-the-air local fm signals. However, before performing this alignment, be sure that the dial is mechanically calibrated and the AFC switch is set to OFF.

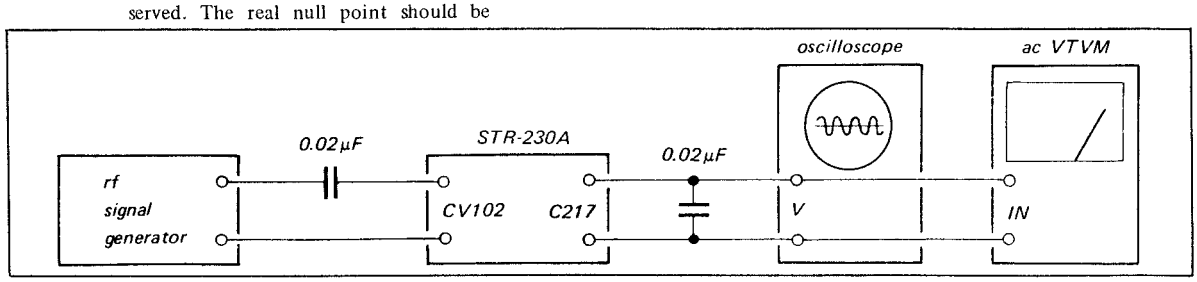


Fig. 3-5. Test setup for fm discriminator alignment by rf signal generator

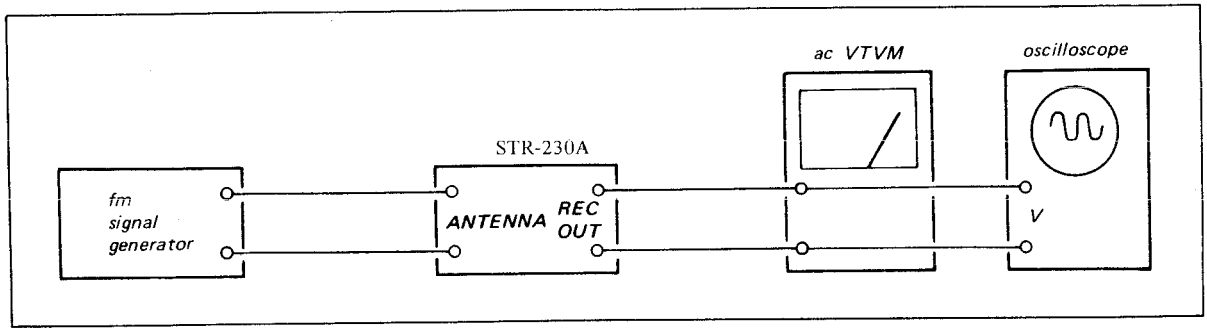


Fig. 3-7. Fm frequency coverage and tracking alignment test setup

TABLE 3-2. FM FREQUENCY COVERAGE AND TRACKING ALIGNMENT

FM FREQUENCY COVERAGE ALIGNMENT						
Step	**Coupling Between Receiver and SSG**	**SSG Frequency and Output Level**	**Tuner Dial Indication**	**Ac VTVM Connection**	**Adjust**	**Indication**
1	Direct coupling	87.2 MHz (※ 87.5 MHz) 400 Hz 100 % mod. 10 μV (20 dB)	lowest position	REC OUT	OSC coil L103 See Fig. 3-11.	Maximum VTVM reading
2	Same as above	108.4 MHz (※ 108.0 MHz) 400 Hz 100 % mod. 10 μV (20 dB)	highest position	Same as above	OSC trimmer CT103 See Fig. 3-11.	Same as above
FM TRACKING ALIGNMENT						
Step	**Coupling Between Receiver and SSG**	**SSG Frequency and Output Level**	**Tuner Dial Indication**	**Ac VTVM Connection**	**Adjust**	**Indication**
1	Direct coupling	87.2 MHz (※ 87.5 MHz) 400 Hz 100 % mod. 10 μV (20 dB)	lowest position	REC OUT	Antenna coil L101 RF coil L102 See Fig. 3-11.	Maximum VTVM reading
2	Same as above	108.4 MHz (※ 108.0 MHz) 400 Hz 100 % mod. 10 μV (20 dB)	highest position	Same as above	Antenna trimmer CT101 RF trimmer CT102 See Fig. 3-11.	Same as above

※ West Germany Model only

3-3. FM STEREO SEPARATION ADJUSTMENT

Test Equipment Required

1. MPX generator
2. Fm signal generator
3. Audio oscillator
4. Ac VTVM
5. Oscilloscope
6. Alignment tools

Preparation

Before starting the stereo-separation adjustment, check and adjust the phase between the 19-kHz pilot signal and the sub-channel signal in the MPX stereo generator as follows:

1. With the equipment connected as shown in Fig. 3-8, set the MPX and audio signal-generator's control as follows:

   MAIN CHANNEL..... OFF
   SUB CHANNEL..... ON
   PILOT (19 kHz)..... OFF
   AUDIO OSCILLATOR
   OUTPUT..... 400 Hz, 250 mV

2. Adjust the oscilloscope controls to obtain a visible indication. Be sure the scope's horizontal display switch is set for external input.

3. Turn the pilot-signal (19 kHz) phase control to obtain an in-phase and stable lissajous pattern as shown in Fig. 3-9.

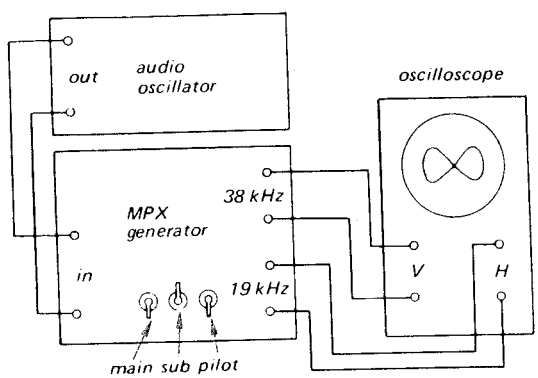


Fig. 3-8. MPX generator preadjustment

Fig. 3-9. Lissajous pattern

Procedure

1. Connect the equipment as shown in Fig. 3-10. Set the fm signal-generator's control as follows:

   Carrier frequency .....98 MHz
   Output level.....1,000 μV (60 dB)
   Modulation:
   Main channel (400 Hz)...33.75 kHz (45 %)
   Sub channel (38 kHz)....33.75 kHz (45 %)
   Pilot (19 kHz).....7.5 kHz (10 %)

   The above mentioned modulation levels can be set as follows:

   (a) With the equipment connected as shown in Fig. 3-10 set the MPX stereo generator controls as follows.

   MAIN CHANNEL..... OFF
   SUB CHANNEL..... OFF
   19 kHz (PILOT)..... ON

   (b) Adjust the 19 kHz signal level to obtain a 7.5-kHz deviation on the FM SSG modulation indicator.

   (c) Reset the MPX stereo-generator's control as follows:

   MAIN CHANNEL .... ON
   SUB CHANNEL..... OFF
   19 kHz (PILOT)..... OFF
   INPUT SELECTOR ... L-CH

   (d) Adjust the audio-oscillator output (400 Hz) to obtain a 33.75-kHz deviation on the FM SSG modulation indicator.

   (e) Set all controls to ON.

2. Precisely tune the receiver to the SSG's carrier frequency then turn the top core of switching transformer L301 (see Fig. 3-11) to obtain maximum output at the left channel.

3. Record the output level of the left channel when the MPX generator input selector is set to the left channel.

4. Switch the input selector to the right channel and read the residual signal level in the left channel.

5. The output-level to residual-level ratio represents the separation. Turn the top core of switching transformer L301 (see Fig. 3-11) for minimum residual level. Check the right channel for separation.

6. Readjust switching transformer L301 for minimum difference between left- and right-channel separation.

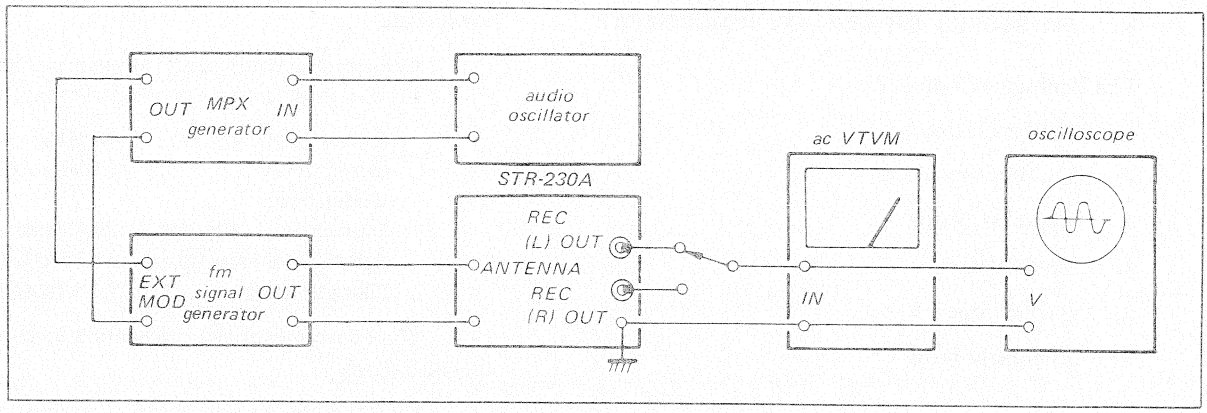


Fig. 3-10. Fm stereo separation adjustment test setup

Adjusting Parts Location

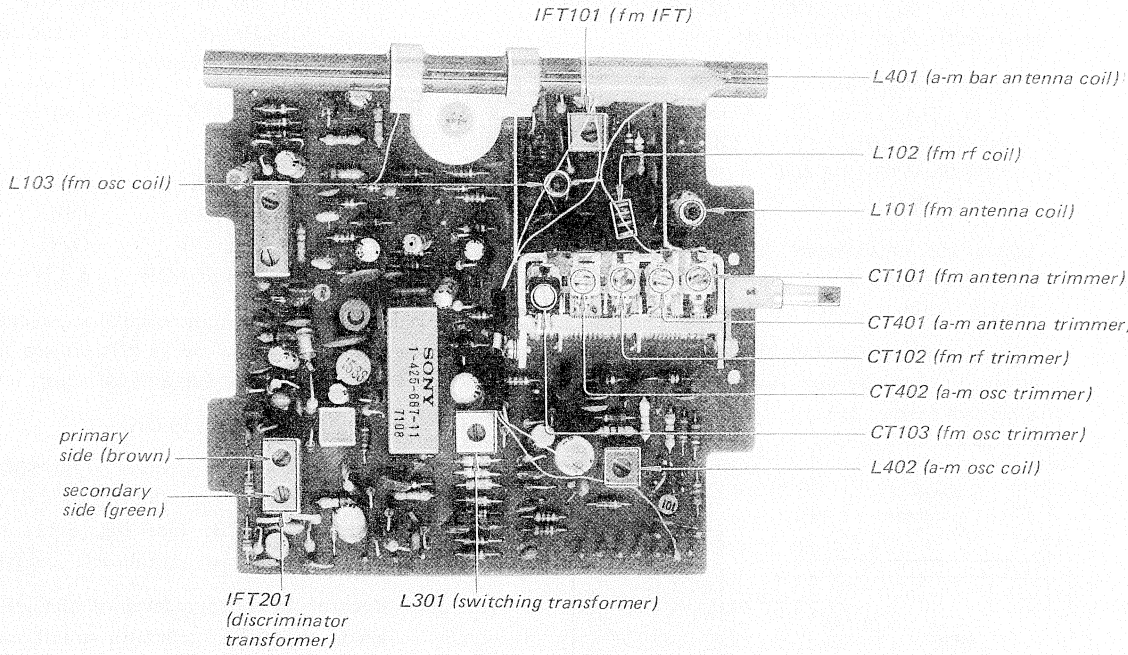


Fig. 3-11. Adjusting parts location

3-4. A-M I-F STRIP ALIGNMENT

Note: The a-m i-f transformers (CFU201 and IFT202) are shipped from the factory with all adjustment set for correct operation. Therefore no adjustment is required in field service.

3-5. A-M FREQUENCY COVERAGE AND TRACKING ALIGNMENT

Preparation

Remove the wooden case as described in Procedure 2-3. Then, set the receiver's Function switch to AM.

Signal Generator Method

Test Equipment Required

1. Signal generator
2. Loop antenna
3. Ac VTVM

Procedure

With the equipment connected as shown in Fig. 3-12, follow the procedures given in Table 3-3 when performing this alignment with an a-m signal generator.

Off-the-Air Signal Method

Accurate dial calibration, and a frequency-coverage and tracking test can also be performed by utilizing off-the-air local a-m signals. However, before performing this alignment, be sure that the dial is mechanically calibrated.

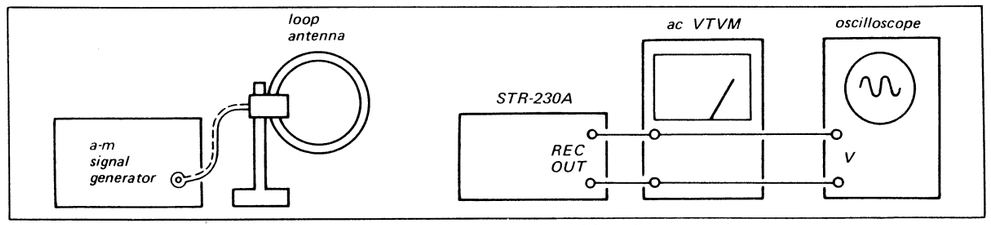


Fig. 3-12. A-m frequency coverage and tracking alignment test setup

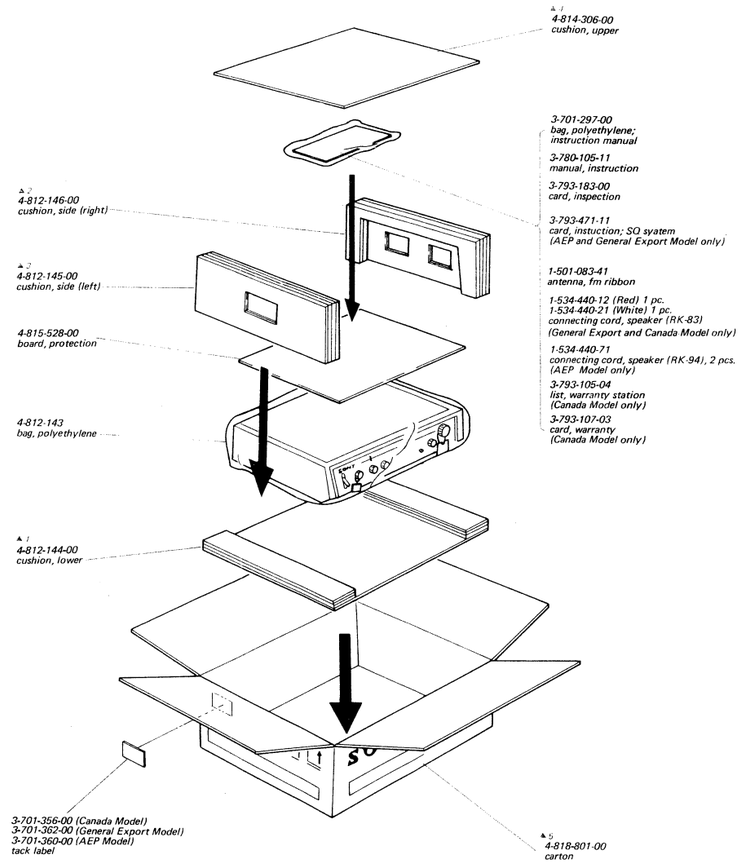
TABLE 3-3. A-M FREQUENCY COVERAGE AND TRACKING ALIGNMENT

SSG Coupling	SSG Frequency and Output Level	Tuner Dial Indication	Ac VTVM Connection	Adjust	Indication
Loop antenna	520 kHz 400 Hz 30 % mod. 1,000 μV (60 dB)	lowest position	REC OUT	OSC coil L402 See Fig. 3-11.	Maximum VTVM reading
Loop antenna	1,680 kHz Same as above	highest position	Same as above	OSC trimmer CT402 See Fig. 3-11.	Same as above

SSG Coupling	SSG Frequency and Output Level	Tuner Dial Indication	Ac VTVM Connection	Adjust	Indication
Loop antenna	600 kHz 400 Hz 30 % mod. Output level as low as possible	Tune to SSG's signal.	REC OUT	Position of antenna coil L401 See Fig. 3-11.	Maximum VTVM reading
Loop antenna	1,400 kHz Same as above	Same as above	Same as above	Antenna trimmer CT401 See Fig. 3-11.	Same as above

SECTION 4
REPACKING

The STR-230A's original shipping carton and packing materials are the ideal containers for shipping the unit. However to secure the maximum protection, the STR-230A must be repacked in these materials precisely as before. The proper repacking procedures are shown in Fig. 4-1.

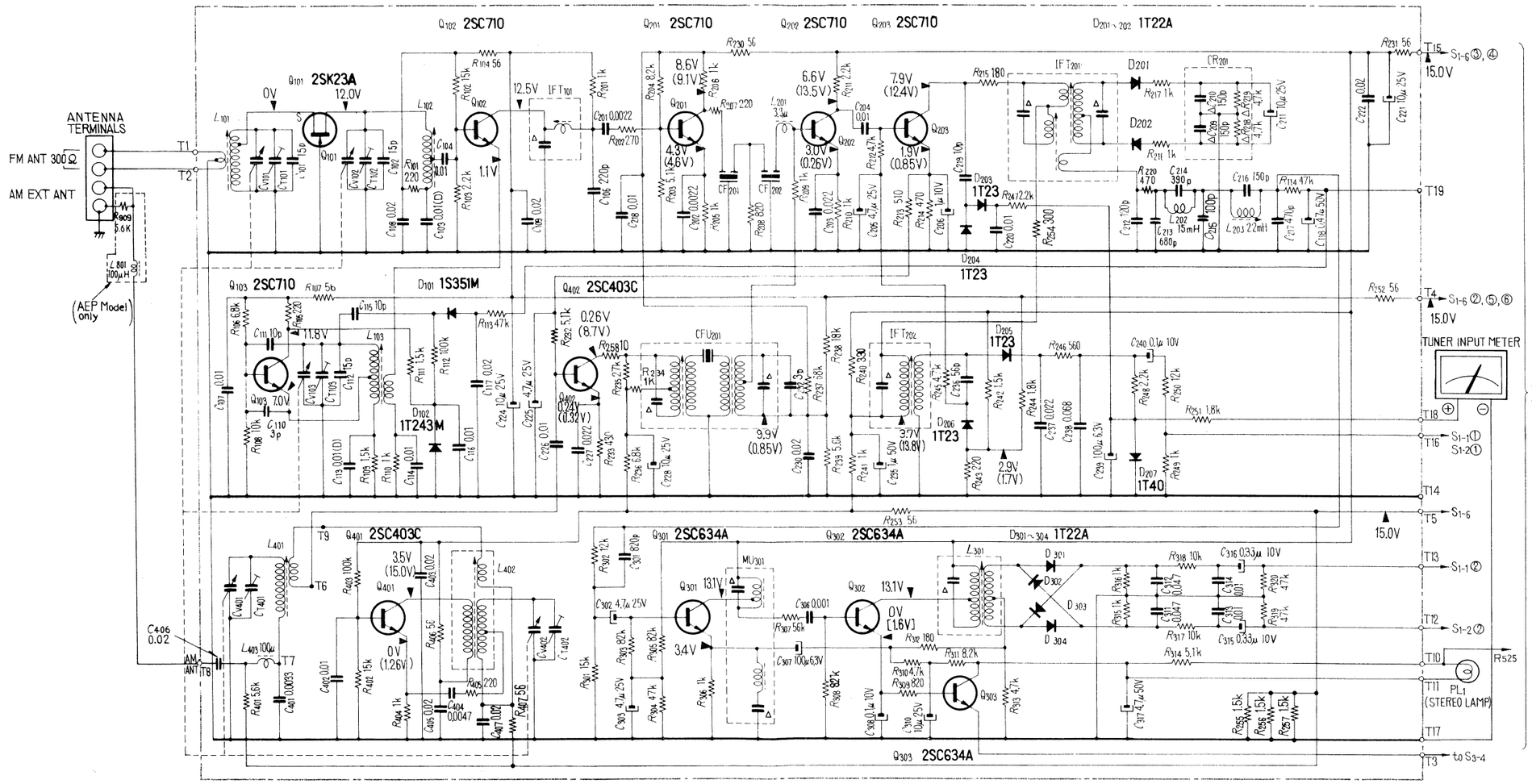

▲1 4-814-306-00 cushion, upper
3-701-297-00 bag, polyethylene; instruction manual
3-780-105-11 manual, instruction
3-793-183-00 card, inspection
3-793-471-11 card, instuction; SO syatem (AEP and General Export Model only)
1-501-083-41 antenna, fm ribbon
1-534-440-12 (Red) 1 pc.
1-534-440-21 (White) 1 pc. connecting cord, speaker (RK-83) (General Export and Canada Model only)
1-534-440-71 connecting cord, speaker (RK-94), 2 pcs. (AEP Model only)
3-793-105-04 list, warranty station (Canada Model only)
3-793-107-03 card, warranty (Canada Model only)
▲2 4-812-146-00 cushion, side (right)
▲2 4-812-145-00 cushion, side (left)
4-815-528-00 board, protection
4-812-143 bag, polyethylene
▲1 4-812-144-00 cushion, lower
3-701-356-00 (Canada Model)
3-701-362-00 (General Export Model)
3-701-360-00 (AEP Model)
tack label
▲5 4-818-801-00 carton

Note: ▲1 ~ 5 carton ass'y (X-48188-02) includes all the parts marked▲

Fig. 4-1. Repacking

SECTION 5
DIAGRAMS

5-1. SCHEMATIC DIAGRAM — Fm (A-m) Front End/I-f Amp/MPX Section — (TCB-012BW1)



Note:

All resistance values are in ohms. k = 1,000. M = 1,000 k

All capacitance values are in μF except as indicated wtih p, which means μμF.

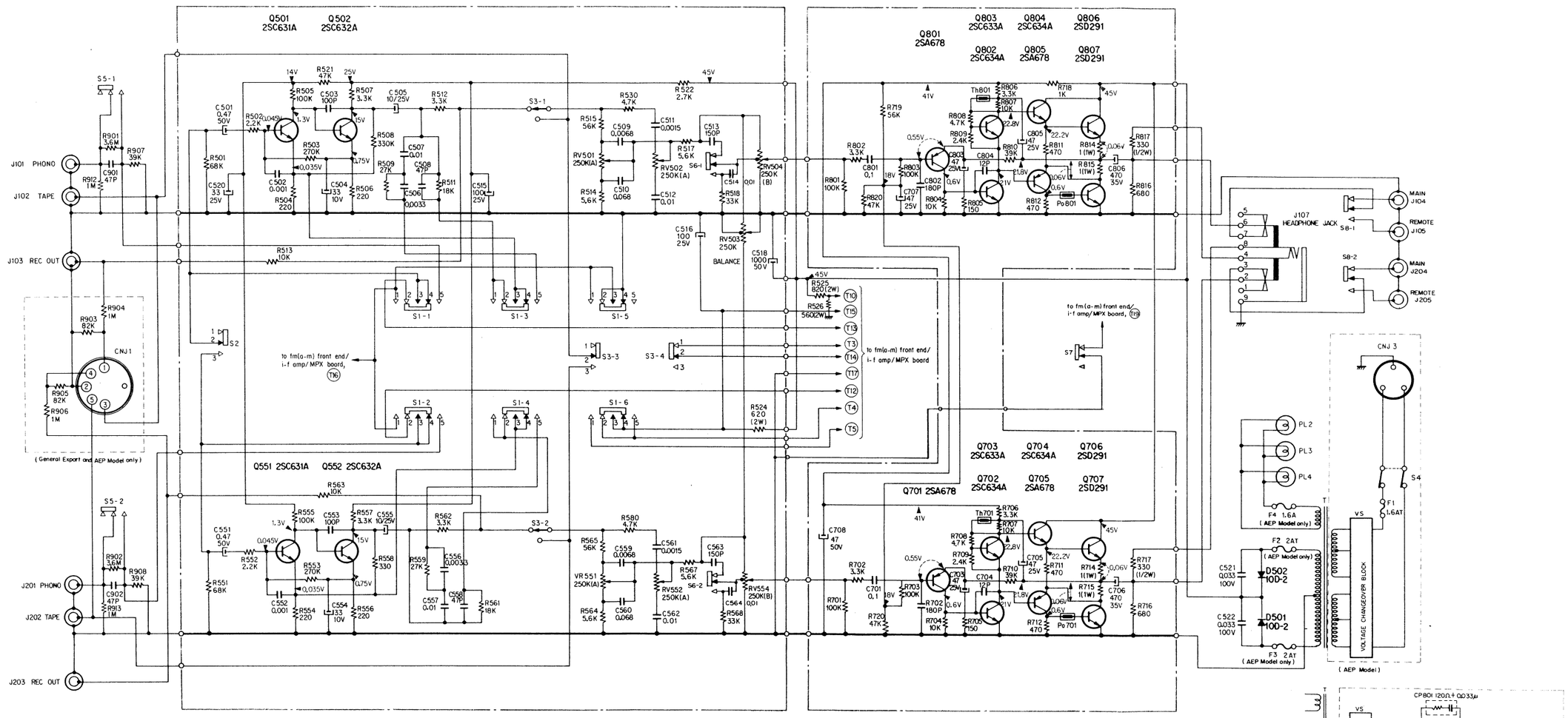
All voltages represent an average value and should hold within ± 10 %.

All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No. signal in.

Voltages in ( ) are measured in a-m mode.

[ ] : STEREO OPERATION

5-2. SCHEMATIC DIAGRAM
– Audio Amplifier Section –



Ref. No.	Description	Position
S1	FUNCTION switch (AM-FM-PHONO)	FM
S3-1, 3-2	MONITOR switch (SOURCE-TAPE)	SOURCE
S2, S3-3, 3-4	MODE switch (STEREO-MONO)	STEREO

Ref No.	Description	Position
S4	POWER switch	ON
S5	CARTRIDGE SELECTOR switch (MAGNETIC-CERAMIC)	CERAMIC
S6	LOUDNESS switch	ON
S7	AFC switch	OFF
S8	SPEAKER switch (MAIN-REMOTE)	MAIN

Note:

All resistance values are in ohms. k = 1,000. M = 1,000 k

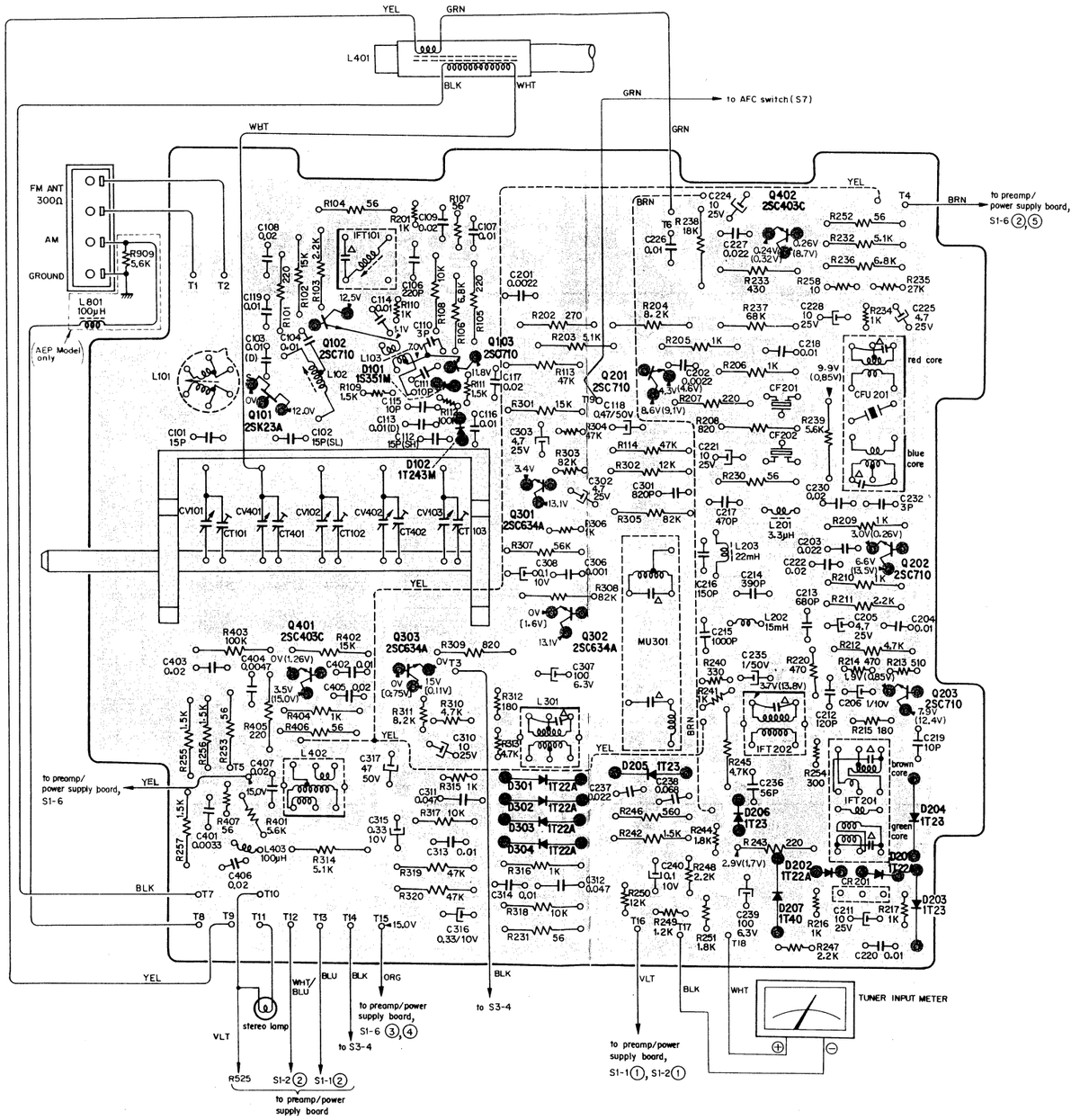
All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ± 10 %.

All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.

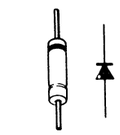
5-3. MOUNTING DIAGRAM — Fm (A-m) Front End/I-f Amp/MPX Board — (TCB-012BW1)

— Conductor Side —

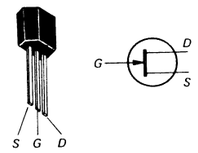


Note: [ ] shows the location of stencilled part number.
Refer to this mark when replacing the part.

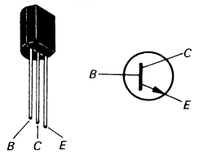
1T23
1T22A
1S351M
1T40



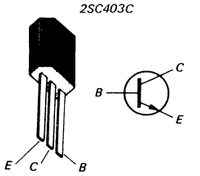
2SK23



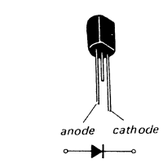
2SC710



2SC634A
2SC403C

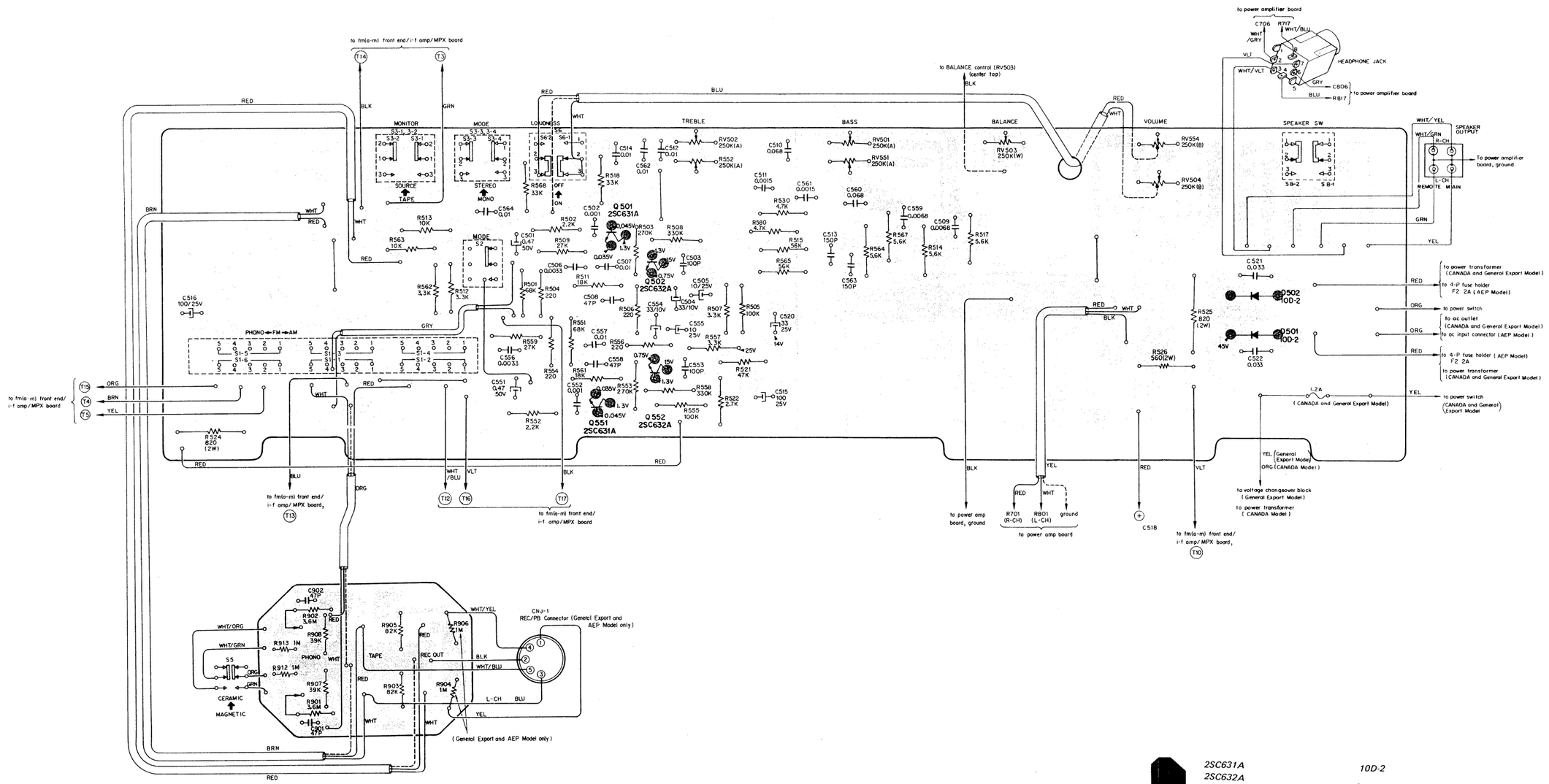


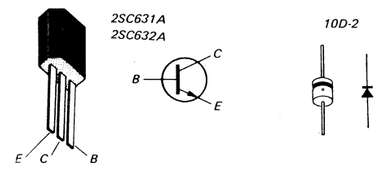
1T243M



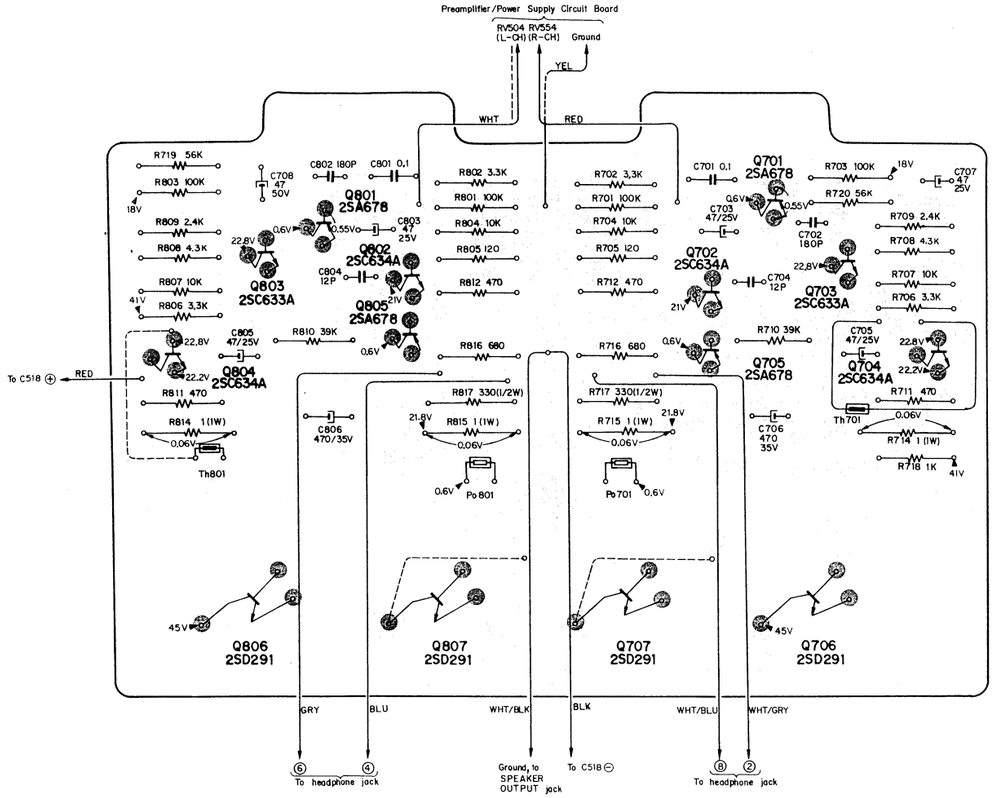
5-4. MOUNTING DIAGRAM — Preamplifier/Power Supply Board —

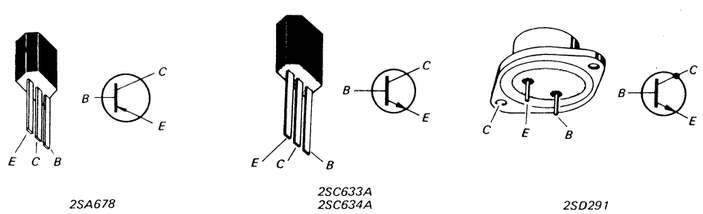
— Conductor Side —



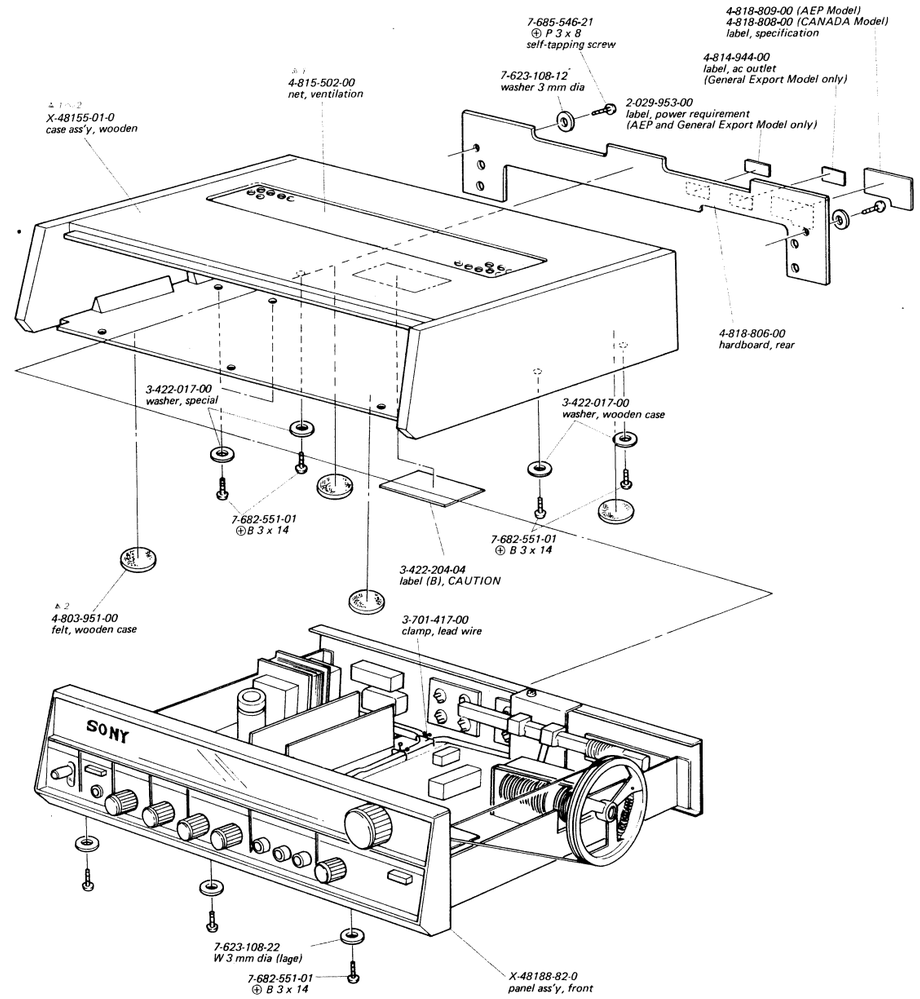


5-5. MOUNTING DIAGRAM – Power Amplifier Board –
– Conductor Side – (PCB-013)

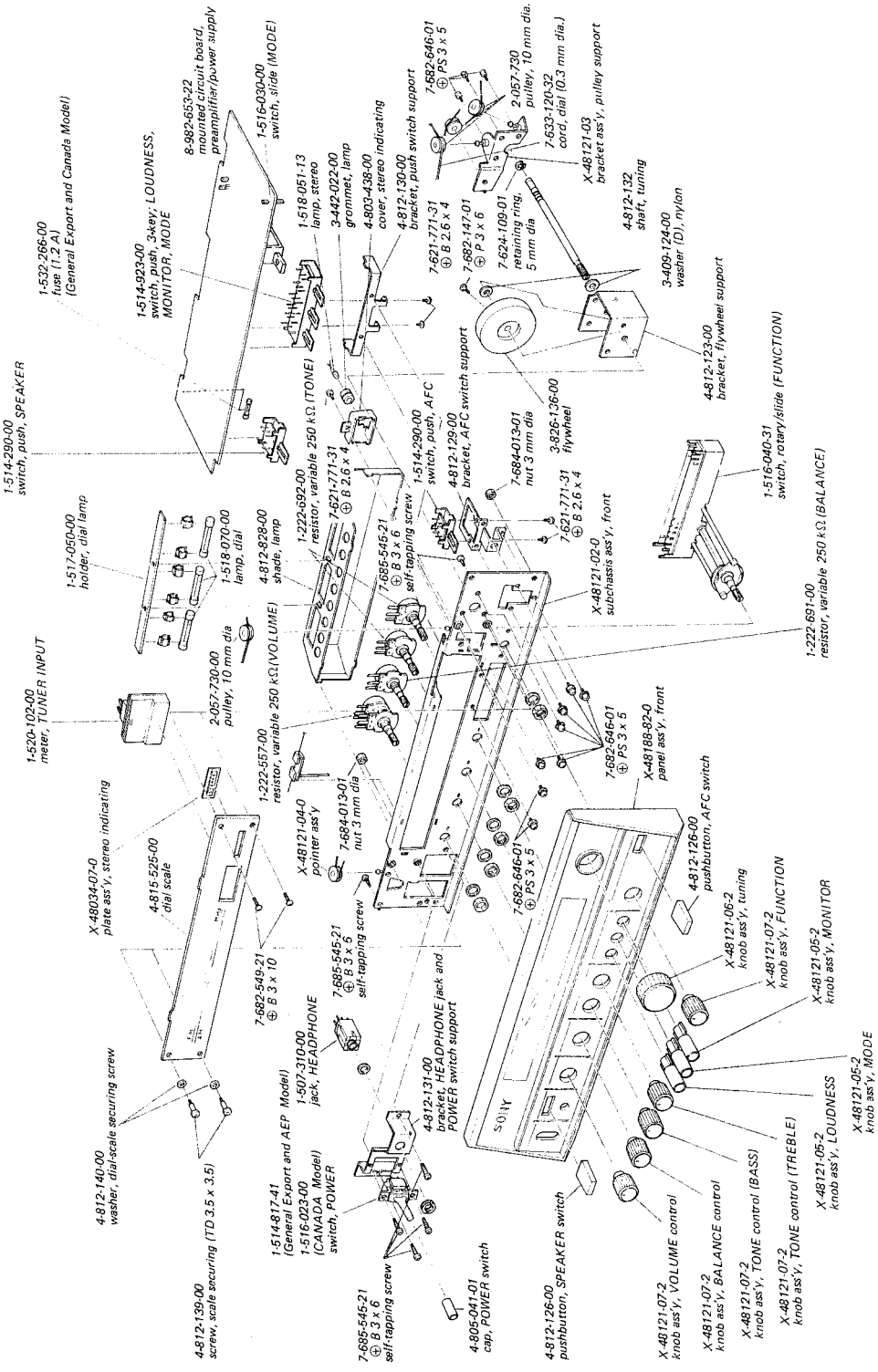




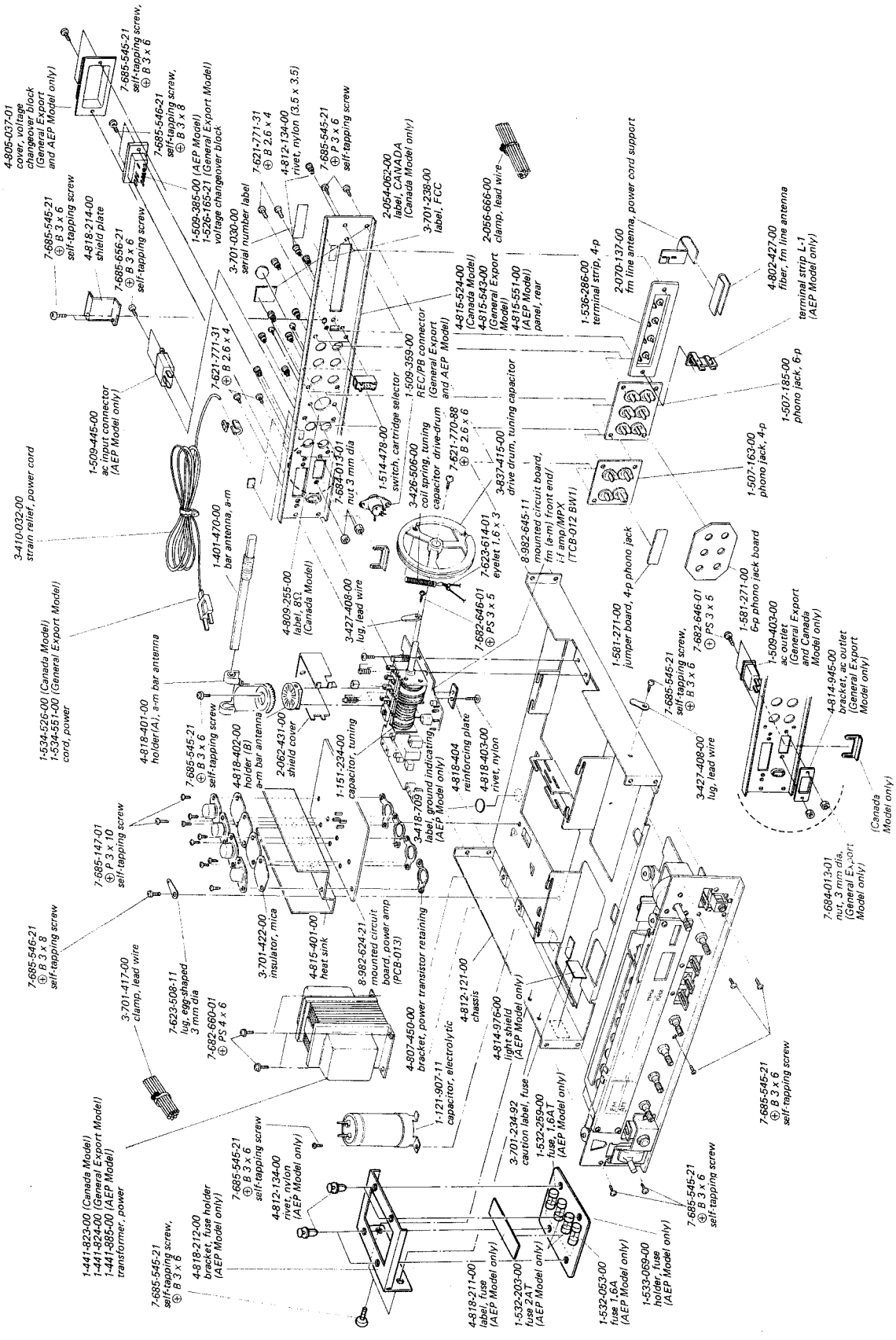
SECTION 6
EXPLODED VIEWS



Note: ▲1 ~ 2 wooden case ass'y (X-48155-01-0) includes all the parts marked ▲


1-520-102-00
meter, TUNER INPUT
1-514-290-00
switch, push, SPEAKER
1-532-266-00
fuse (1.2 A)
(General Export and Canada Model)
8-982-653-22
mounted circuit board,
preamplifier/power supply
1-514-923-00
switch, push, 3-key; LOUDNESS,
MONITOR, MODE
1-516-030-00
switch, slide (MODE)
1-517-050-00
holder, dial lamp
1-518-070-00
lamp, dial
4-812-828-00
shade, lamp
1-518-051-13
lamp, stereo
3-442-022-00
grommet, lamp
4-803-438-00
cover, stereo indicating
4-812-130-00
bracket, push switch support
7-682-646-01
⊕ PS 3 x 5
2-057-730
pulley, 10 mm dia.
7-633-120-32
cord, dial (0.3 mm dia.)
X-48121-03
bracket ass'y, pulley support
4-812-132
shaft, tuning
3-409-124-00
washer (D), nylon
4-812-123-00
bracket, flywheel support
1-516-040-31
switch, rotary/slide (FUNCTION)
1-222-691-00
resistor, variable 250 kΩ (BALANCE)
2-057-730-00
pulley, 10 mm dia
1-222-557-00
resistor, variable 250 kΩ (VOLUME)
1-222-692-00
resistor, variable 250 kΩ (TONE)
7-621-771-31
⊕ B 2.6 x 4
7-685-545-21
⊕ B 3 x 6
self-tapping screw
1-514-290-00
switch, push, AFC
4-812-129-00
bracket, AFC switch support
7-682-147-01
⊕ P 3 x 6
7-624-109-01
retaining ring,
5 mm dia
7-684-013-01
nut 3 mm dia
3-826-136-00
flywheel
X-48121-02-0
subchassis ass'y, front
X-48034-07-0
plate ass'y, stereo indicating
4-815-525-00
dial scale
X-48121-04-0
pointer ass'y
7-682-549-21
⊕ B 3 x 10
4-812-140-00
washer, dial-scale securing screw
4-812-139-00
screw, scale securing (TD 3.5 x 3.5)
1-514-817-41
(General Export and AEP Model)
1-516-023-00
(CANADA Model)
switch, POWER
1-507-310-00
jack, HEADPHONE
4-812-131-00
bracket, HEADPHONE jack and
POWER switch support
7-685-545-21
⊕ B 3 x 6
self-tapping screw
4-805-041-01
cap, POWER switch
4-812-126-00
pushbutton, SPEAKER switch
7-682-646-01
⊕ PS 3 x 5
X-48188-82-0
panel ass'y, front
4-812-126-00
pushbutton, AFC switch
X-48121-06-2
knob ass'y, tuning
X-48121-07-2
knob ass'y, FUNCTION
X-48121-05-2
knob ass'y, MONITOR
X-48121-07-2
knob ass'y, VOLUME control
X-48121-07-2
knob ass'y, BALANCE control
X-48121-07-2
knob ass'y, TONE control (BASS)
X-48121-07-2
knob ass'y, TONE control (TREBLE)
X-48121-05-2
knob ass'y, LOUDNESS
X-48121-05-2
knob ass'y, MODE

STR-230A


4-805-037-01 cover, voltage changeover block (General Export and AEP Model only)
7-685-546-21 ⊕ B 3 x 8 self-tapping screw
7-685-545-21 ⊕ B 3 x 6 self-tapping screw
4-818-214-00 shield plate
7-685-656-21 ⊕ B 3 x 6 self-tapping screw
7-685-545-21 self-tapping screw, ⊕ B 3 x 6
7-685-545-21 self-tapping screw, ⊕ B 3 x 8
1-509-385-00 (AEP Model)
1-526-165-21 (General Export Model) voltage changeover block
3-701-030-00 serial number label
7-621-771-31 ⊕ B 2.6 x 4
4-812-134-00 rivet, nylon (3.5 x 3.5)
7-685-545-21 ⊕ P 3 x 6 self-tapping screw
2-054-062-00 label, CANADA (Canada Model only)
3-701-238-00 label, FCC
2-066-666-00 clamp, lead wire
1-509-445-00 ac input connector (AEP Model only)
7-621-771-31 ⊕ B 2.6 x 4
3-410-032-00 strain relief, power cord
1-534-526-00 (Canada Model)
1-534-551-00 (General Export Model) cord, power
1-401-470-00 bar antenna, a-m
4-809-255-00 label, 8Ω (Canada Model)
1-514-478-00 switch, cartridge selector
7-684-013-01 nut, 3 mm dia
1-509-359-00 REC/PB connector (General Export and AEP Model)
4-815-524-00 (Canada Model)
4-815-543-00 (General Export Model)
4-815-551-00 (AEP Model) panel, rear
1-536-286-00 terminal strip, 4-p
2-070-137-00 fm line antenna, power cord support
4-802-427-00 fiber, fm line antenna terminal strip L-1 (AEP Model only)
3-426-506-00 coil spring, tuning capacitor drive-drum
7-621-770-88 ⊕ B 2.6 x 6
3-837-415-00 drive drum, tuning capacitor
8-982-645-11 mounted circuit board, fm (a-m) front end/ i-f amp/MPX (TCB-012 BW1)
1-507-185-00 phono jack, 6-p
1-507-163-00 phono jack, 4-p
4-818-401-00 holder(A), a-m bar antenna
7-685-545-21 ⊕ B 3 x 6 self-tapping screw
4-818-402-00 holder (B) a-m bar antenna
2-062-431-00 shield cover
1-151-234-00 capacitor, tuning
3-427-408-00 lug, lead wire
7-623-614-01 eyelet 1.6 x 3
7-682-646-01 ⊕ PS 3 x 5
1-581-271-00 jumper board, 4-p phono jack
1-581-271-00 6-p phono jack board
1-509-403-00 ac outlet (General Export and Canada Model only)
4-814-945-00 bracket, ac outlet (General Export Model only)
(Canada Model only)
7-685-545-21 self-tapping screw, ⊕ B 3 x 6
7-682-646-01 ⊕ PS 3 x 5
3-427-408-00 lug, lead wire
7-685-147-01 ⊕ P 3 x 10 self-tapping screw
3-418-709 label, ground indicating (AEP Model only)
4-818-404 reinforcing plate
4-818-403-00 rivet, nylon
3-701-417-00 clamp, lead wire
7-623-508-11 lug, egg-shaped 3 mm dia
7-682-660-01 ⊕ PS 4 x 6
3-701-422-00 insulator, mica
4-815-401-00 heat sink
8-982-624-21 mounted circuit board, power amp. (PCB-013)
4-807-450-00 bracket, power transistor retaining
4-812-121-00 chassis
4-814-976-00 light shield (AEP Model only)
1-121-907-11 capacitor, electrolytic
3-701-234-92 caution label, fuse
1-532-259-00 fuse, 1.6AT (AEP Model only)
7-684-013-01 nut, 3 mm dia (General Export Model only)
1-441-823-00 (Canada Model)
1-441-824-00 (General Export Model)
1-441-885-00 (AEP Model) transformer, power
7-685-545-21 self-tapping screw, ⊕ B 3 x 6
4-818-212-00 bracket, fuse holder (AEP Model only)
7-685-545-21 ⊕ B 3 x 6 self-tapping screw
4-812-134-00 rivet, nylon (AEP Model only)
4-818-211-00 label, fuse (AEP Model only)
1-532-203-00 fuse 2AT (AEP Model only)
1-532-053-00 fuse 1.6A (AEP Model only)
1-533-069-00 holder, fuse (AEP Model only)
7-685-545-21 ⊕ B 3 x 6 self-tapping screw
7-685-545-21 ⊕ B 3 x 6 self-tapping screw

SECTION 7

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description

MOUNTED CIRCUIT BOARDS

	8-982-645-11	fm (a-m) front-end/i-f amplifier/MPX circuit board (TCB-012BW1)
	8-982-624-21	power amplifier circuit board (PCB-013)
	8-982-653-22	preamplifier/power supply circuit board

SEMICONDUCTORS

D101		diode	1S351M
D102		diode	1T243M
D201		diode	1T22A
D202		diode	1T22A
D203		diode	1T23
D204		diode	1T23
D205		diode	1T23
D206		diode	1T23
D207		diode	1T40
D301		diode	1T22A
D302		diode	1T22A
D303		diode	1T22A
D501		diode	10D-2
D502		diode	10D-2
P0701 (P0801)	1-800-076-00	posistor	
Q101		FET	2SK23A
Q102		transistor	2SC710
Q103		transistor	2SC710
Q201		transistor	2SC710
Q202		transistor	2SC710
Q203		transistor	2SC710
Q301		transistor	2SC634A
Q302		transistor	2SC634A
Q303		transistor	2SC634A
Q401		transistor	2SC403C
Q402		transistor	2SC403C
Q501 (Q551)		transistor	2SC631A
Q502(Q552)		transistor	2SC632A
Q701(Q801)		transistor	2SA678
Q702(Q802)		transistor	2SC634A
Q703(Q803)		transistor	2SC633A
Q704(Q804)		transistor	2SC634A
Q705(Q805)		transistor	2SA678
Q706(Q806)		transistor	2SD291
Q707(Q807)		transistor	2SD291
Th701 (Th801)	1-800-077-00	thermistor	

Ref. No.	Part No.	Description

TRANSFORMERS, COILS AND INDUCTORS

CFU201	1-403-150-00	CFU, 455 kHz
IFT101	1-403-821-00	IFT, 10.7 MHz
IFT201	1-403-822-00	transformer, discriminator
IFT202	1-403-820-00	IFT, 455 kHz
L101	1-401-471	coil, fm antenna
L102	1-425-547-00	coil, fm rf
L103	1-405-434-00	coil, fm osc.
L201	1-407-184-00	inductor, micro 3.3 μH
L202	1-407-585-12	inductor, micro 15 mH
L203	1-407-418-11	shielded inductor 22 mH
L301	1-425-688-00	transformer, switching
L401	1-401-470-00	bar antenna, a-m
L402	1-405-486-00	coil, a-m osc.
L403	1-407-169-00	inductor, micro 100 μH
MU301	1-425-687-00	MPX unit
T	1-441-823-00	transformer, power (CANADA Model)
	1-441-824-00	transformer, power (General Export Model)
	1-441-885-00	transformer, power (AEP Model)
L801	1-407-169-00	inductor, micro 100 μH (AEP Model only)

CAPACITORS

All capacitance values are in μF except as indicated with p, which means μμF.

C101	1-102-951-00	15 p	± 5 %	50 V	ceramic
C102	1-102-951-00	15 p	± 5 %	50 V	ceramic
C103	1-101-118-00	0.01	$\pm {}^{100}_{0}$ %	50 V	ceramic
C104	1-101-923-00	0.01	$\pm {}^{80}_{20}$ %	25 V	ceramic
C105		.....			
C106	1-102-978-00	220 p	± 5 %	50 V	ceramic
C107	1-101-923-00	0.01	$\pm {}^{80}_{20}$ %	25 V	ceramic
C108	1-101-924-00	0.02	$\pm {}^{80}_{20}$ %	25 V	ceramic
C109	1-101-924-00	0.02	$\pm {}^{80}_{20}$ %	25 V	ceramic
C110	1-102-862-00	3 p	± 0.25 p	50 V	ceramic
C111	1-102-947-00	10 p	± 5 %	50 V	ceramic
C112	1-101-971-00	15 p	± 5 %	50 V	ceramic
C113	1-101-118-00	0.01	$+ {}^{100}_{0}$ %	50 V	ceramic
C114	1-101-923-00	0.01	$\pm {}^{80}_{20}$ %	25 V	ceramic
C115	1-102-947-00	10 p	± 5 %	50 V	ceramic
C116	1-101-923-00	0.01	$\pm {}^{80}_{20}$ %	25 V	ceramic
C117	1-101-924-00	0.02	$\pm {}^{80}_{20}$ %	25 V	ceramic
C118	1-121-434-00	0.47	$\pm {}^{75}_{10}$ %	50 V	electrolytic
C119	1-101-118-00	0.01	$\pm {}^{100}_{10}$ %	50 V	ceramic
C201	1-101-919-00	0.0022	$\pm {}^{80}_{20}$ %	25 V	ceramic
C202	1-105-665-12	0.0022	± 10 %	50 V	mylar
C203	1-105-677-12	0.022	± 10 %	50 V	mylar

Ref. No.	Part No.	Description
C204	1-101-923-00	0.01 ± 80 20 % 25 V ceramic
C205	1-121-395-00	4.7 ± 150 10 % 25 V electrolytic
C206	1-127-023-00	1 ± 20 % 10 V solid, aluminum
C207		.....
C208	1-101-923-00	0.01 ± 80 20 % 25 V ceramic
C209		.....
C210		.....
C211	1-121-398-00	10 ± 100 10 % 25 V electrolytic
C212	1-101-340-00	120 p ± 10 % 50 V ceramic
C213	1-102-116-00	680 p ± 10 % 50 V ceramic
C214	1-102-822-00	390 p ± 5 % 50 V ceramic
C215	1-102-074-00	1000 p ± 10 % 50 V ceramic
C216	1-101-361-00	150 p ± 5 % 50 V ceramic
C217	1-102-824-00	470 p ± 5 % 50 V ceramic
C218	1-101-923-00	0.01 ± 80 20 % 25 V ceramic
C219	1-102-947-00	10 p ± 5 % 50 V ceramic
C220	1-101-923-00	0.01 ± 80 20 % 25 V ceramic
C221	1-121-398-00	10 ± 100 10 % 25 V electrolytic
C222	1-101-924-00	0.02 ± 80 20 % 25 V ceramic
C223		.....
C224	1-121-398-00	10 ± 100 10 % 25 V electrolytic
C225	1-121-395-00	4.7 ± 150 10 % 25 V electrolytic
C226	1-101-923-00	0.01 ± 80 20 % 25 V ceramic
C227	1-105-677-12	0.022 ± 10 % 50 V mylar
C228	1-121-398-00	10 ± 100 10 % 25 V electrolytic
C229		.....
C230	1-101-924-00	0.02 ± 80 20 % 25 V ceramic
C231		.....
C232	1-102-940-00	3 p ± 5 % 50 V ceramic
C233		.....
C234		.....
C235	1-121-391-00	1 ± 150 10 % 50 V electrolytic
C236	1-101-884-00	56 p ± 5 % 50 V ceramic
C237	1-105-677-12	0.022 ± 10 % 50 V mylar
C238	1-105-683-12	0.068 ± 10 % 50 V mylar
C239	1-121-413-00	100 ± 100 10 % 6.3 V electrolytic
C240	1-127-019-00	0.1 ± 20 % 10 V solid, aluminum
C301	1-102-117-00	820 p ± 10 % 50 V ceramic
C302	1-121-395-00	4.7 ± 150 10 % 25 V electrolytic
C303	1-121-395-00	4.7 ± 150 10 % 25 V electrolytic
C304		.....
C305		.....
C306	1-105-661-12	0.001 ± 10 % 50 V mylar
C307	1-121-413-00	100 ± 100 10 % 6.3 V electrolytic
C308	1-127-019-00	0.1 ± 20 % 10 V solid, aluminum
C309		.....
C310	1-121-398-00	10 ± 100 10 % 25 V electrolytic
C311	1-105-681-12	0.047 ± 10 % 50 V mylar
C312	1-105-681-12	0.047 ± 10 % 50 V mylar
C313	1-105-673-12	0.01 ± 10 % 50 V mylar
C314	1-105-673-12	0.01 ± 10 % 50 V mylar
C315	1-127-021-00	0.33 ± 20 % 10 V solid, aluminum
C316	1-127-021-00	0.33 ± 20 % 10 V solid, aluminum
C317	1-121-411-00	47 ± 50 10 % 50 V electrolytic
C401	1-105-667-12	0.0033 ± 10 % 50 V mylar
C402	1-101-923-00	0.01 ± 80 20 % 25 V ceramic
C403	1-101-924-00	0.02 ± 80 20 % 25 V ceramic
C404	1-105-669-12	0.0047 ± 10 % 50 V mylar
C405	1-101-924-00	0.02 ± 80 20 % 25 V ceramic
C406	1-101-924-00	0.02 ± 80 20 % 25 V ceramic
C407	1-101-924-00	0.02 ± 80 20 % 25 V ceramic
C501(C551)	1-121-726-00	0.47 ± 150 10 % 50 V electrolytic
C502(C552)	1-105-661-12	0.001 ± 10 % 50 V mylar
C503(C553)	1-102-975-00	100 p ± 10 % 50 V ceramic
C504(C554)	1-121-402-00	33 ± 100 10 % 10 V electrolytic
C505(C555)	1-121-398-00	10 ± 100 10 % 25 V electrolytic
C506(C556)	1-105-667-12	0.0033 ± 10 % 50 V mylar
C507(C557)	1-105-673-12	0.01 ± 10 % 50 V mylar
C508(C558)	1-101-880-00	47 p ± 5 % 50 V ceramic
C509(C559)	1-105-671-12	0.0068 ± 10 % 50 V mylar
C510(C560)	1-105-683-12	0.068 ± 10 % 50 V mylar
C511(C561)	1-105-663-12	0.0015 ± 10 % 50 V mylar
C512(C562)	1-105-673-12	0.01 ± 10 % 50 V mylar
C513(C563)	1-107-135-00	150 p ± 10 % 50 V silvered mica
C514(C564)	1-105-673-12	0.01 ± 10 % 50 V mylar
C515	1-121-416-00	100 ± 100 10 % 25 V electrolytic
C516	1-121-416-00	100 ± 100 10 % 25 V electrolytic
C517		.....
C518	1-121-907-11	1000 ± 100 10 % 50 V electrolytic
C519		.....
C520	1-121-404-00	33 ± 100 10 % 25 V electrolytic
C521	1-105-719-12	0.033 ± 10 % 100 V mylar
C522	1-105-719-12	0.033 ± 10 % 100 V mylar
C701(C801)	1-105-685-12	0.1 ± 10 % 50 V mylar
C702(C802)	1-102-976-00	180 p ± 5 % 50 V ceramic
C703(C803)	1-121-410-00	47 ± 100 10 % 25 V electrolytic
C704(C804)	1-102-946-00	12 p ± 5 % 50 V ceramic
C705(C805)	1-121-410-00	47 ± 100 10 % 25 V electrolytic
C706(C806)	1-121-361-00	470 ± 100 10 % 35 V electrolytic
C707	1-121-410-00	47 ± 100 10 % 25 V electrolytic
C708	1-121-411-00	47 ± 100 10 % 50 V electrolytic
C901	1-101-880-00	47 p ± 5 % 50 V ceramic
C902	1-101-880-00	47 p ± 5 % 50 V ceramic
CV101		
CV102		
CV103	1-151-234-00	capacitor, tuning
CV401		
CV402		

RESISTORS

All resistance values are in Ω, ± 10 %, ¼ W and composition type unless otherwise indicated.

R101	1-202-367-00	220
R102	1-202-411-00	15 k

Ref. No.	Part No.	Description			
R103	1-202-391-00	2.2 k			
R104	1-202-343-00	56			
R105	1-202-367-00	220			
R106	1-202-403-00	6.8 k			
R107	1-202-343-00	56			
R108	1-202-407-00	10 k			
R109	1-202-387-00	1.5 k			
R110	1-202-383-00	1 k			
R111	1-202-387-00	1.5 k			
R112	1-202-431-00	100 k			
R113	1-202-423-00	47 k			
R114	1-202-423-00	47 k			
R201	1-202-383-00	1 k			
R202	1-202-369-00	270			
R203	1-202-400-00	5.1 k			
R204	1-202-405-00	8.2 k			
R205	1-202-383-00	1 k			
R206	1-202-383-00	1 k			
R207	1-202-367-00	220			
R208	1-202-381-00	820			
R209	1-202-383-00	1 k			
R210	1-244-673-00	1 k	± 5 %	¼W	carbon
R211	1-202-391-00	2.2 k			
R212	1-202-399-00	4.7 k			
R213	1-202-376-00	510			
R214	1-242-665-00	470	± 5 %	¼W	carbon
R215	1-202-365-00	180			
R216	1-202-383-00	1 k			
R217	1-202-383-00	1 k			
R218		.....			
R219		.....			
R220	1-202-375-00	470			
R230	1-202-343-00	56			
R231	1-202-343-00	56			
R232	1-202-400-00	5.1 k			
R233	1-244-664-00	430	± 5 %	¼W	carbon
R234	1-202-383-00	1 k			
R235	1-202-417-00	27 k			
R236	1-202-403-00	6.8 k			
R237	1-244-717-00	68 k	± 5 %	¼W	carbon
R238	1-244-703-00	18 k	± 5 %	¼W	carbon
R239	1-244-691-00	5.6 k	± 5 %	¼W	carbon
R240	1-202-371-00	330			
R241	1-202-383-00	1 k			
R242	1-244-677-00	1.5 k	± 5 %	¼W	carbon
R243	1-244-657-00	220	± 5 %	¼W	carbon
R244	1-202-389-00	1.8 k			
R245	1-202-399-00	4.7 k			
R246	1-202-377-00	560			
R247	1-202-391-00	2.2 k			
R248	1-202-391-00	2.2 k			
R249	1-242-675-00	1.2 k	± 5 %	¼W	carbon
R250	1-202-409-00	12 k			

Ref. No.	Part No.	Description			
R251	1-202-389-00	1.8 k			
R252	1-202-343-00	56			
R253	1-202-343-00	56			
R254	1-202-370-00	300			
R255	1-202-387-00	1.5 k			
R256	1-202-387-00	1.5 k			
R257	1-202-387-00	1.5 k			
R258	1-202-325-00	10			
R301	1-202-411-00	15 k			
R302	1-202-409-00	12 k			
R303	1-202-429-00	82 k			
R304	1-202-423-00	47 k			
R305	1-202-429-00	82 k			
R306	1-202-383-00	1 k			
R307	1-202-425-00	56 k			
R308	1-202-429-00	82 k			
R309	1-202-381-00	820			
R310	1-202-399-00	4.7 k			
R311	1-202-405-00	8.2 k			
R312	1-202-365-00	180			
R313	1-202-399-00	4.7 k			
R314	1-202-400-00	5.1 k			
R315	1-202-383-00	1 k			
R316	1-202-383-00	1 k			
R317	1-202-407-00	10 k			
R318	1-202-407-00	10 k			
R319	1-202-423-00	47 k			
R320	1-202-423-00	47 k			
R329	1-202-423-00	47 k			
R401	1-202-401-00	5.6 k			
R402	1-202-411-00	15 k			
R403	1-202-431-00	100 k			
R404	1-202-383-00	1 k			
R405	1-202-367-00	220			
R406	1-202-343-00	56			
R407	1-202-343-00	56			
R501(R551)	1-244-717-00	68 k	± 5 %	¼ W	carbon
R502(R552)	1-244-681-00	1.2 k	± 5 %	¼ W	carbon
R503(R553)	1-244-731-00	270 k	± 5 %	¼ W	carbon
R504(R554)	1-244-657-00	220	± 5 %	¼ W	carbon
R505(R555)	1-244-721-00	100 k	± 5 %	¼ W	carbon
R506(R556)	1-244-657-00	220	± 5 %	¼ W	carbon
R507(R557)	1-244-685-00	3.3 k	± 5 %	¼ W	carbon
R508(R558)	1-244-733-00	330 k	± 5 %	¼ W	carbon
R509(R559)	1-244-707-00	27 k	± 5 %	¼ W	carbon
R510		.....			
R511(R561)	1-244-703-00	18 k	± 5 %	¼ W	carbon
R512(R562)	1-244-685-00	3.3 k	± 5 %	¼ W	carbon
R513(R563)	1-244-697-00	10 k	± 5 %	¼ W	carbon
R514(R564)	1-244-691-00	5.6 k	± 5 %	¼ W	carbon
R515(R565)	1-244-715-00	56 k	± 5 %	¼ W	carbon
R516		.....			
R517(R567)	1-244-691-00	5.6 k	± 5 %	¼ W	carbon

Ref. No.	Part No.	Description
R518 (R568)	1-244-709-00	33 k ± 5 % ¼ W carbon
R519		.....
R520		.....
R521	1-244-713-00	47 k ± 5 % ¼ W carbon
R522	1-244-683-00	2.7 k ± 5 % ¼W carbon
R523		.....
R524	1-206-659-00	620 ± 5 % 2W metal-oxide
R525	1-206-662-00	820 ± 5 % 2 W metal-oxide
R526	1-206-658-00	560 ± 5 % 2 W metal-oxide
R530(R580)	1-244-689-00	4.7 k ± 5 % ¼W carbon
R701(R801)	1-202-431-00	100 k
R702(R802)	1-202-395-00	3.3 k
R703(R803)	1-202-431-00	100 k
R704(R804)	1-202-407-00	10 k
R705(R805)	1-202-363-00	150
R706(R806)	1-202-395-00	3.3 k
R707(R807)	1-202-407-00	10 k
R708(R808)	1-244-689-00	4.7 k ± 5 % ¼W carbon
R709(R809)	1-244-682-00	2.4 k ± 5 % ¼W carbon
R710(R810)	1-202-421-00	39 k
R711(R811)	1-202-375-00	470
R712(R812)	1-202-375-00	470
R713(R813)		.....
R714(R814)	1-212-385-00	1 ± 10 % 1W metal-oxide
R715(R815)	1-212-385-00	1 ± 10 % 1W metal-oxide
R716(R816)	1-202-379-00	680
R717(R817)	1-202-561-00	330
R718	1-202-383-00	1 k
R719	1-202-425-00	56 k
R720	1-202-423-00	47 k
R901	1-202-468-31	3.6 M ± 5 % ¼W composition
R902	1-202-468-31	3.6 M ± 5 % ¼W composition
R903	1-244-719-00	82 k ± 5 % ¼W carbon (AEP and General Export Model only)
R904	1-244-745-00	1 M ± 5 % ¼W carbon (AEP and General Export Model only)
R905	1-244-719-00	82 k ± 5 % ¼W carbon (AEP and General Export Model only)
R906	1-244-745-00	1 M ± 5 % ¼W carbon (AEP and General Export Model only)
R907	1-244-711-00	39 k ± 5 % ¼W carbon
R908	1-244-711-00	39 k ± 5 % ¼W carbon
R909	1-244-691-11	5.6 k ± 5 % ¼W carbon (AEP Model only)
R910	1-202-657-31	3.3 M ½ W composition (CANADA Model only)
R911	1-202-657-31	3.3 M ½ W composition (CANADA Model only)
R912	1-244-745-00	1 M ± 5 % ¼ W carbon
R913	1-244-745-00	1 M ± 5 % ¼ W carbon
RV501 (RV551)	1-222-692-00	250 k (A), variable (BASS control)
RV502 (RV552)	1-222-692-00	250 k (A), variable (TREBLE control)
RV503	1-222-691-00	250 k (W), variable (BALANCE control)
RV504 (RV554)	1-222-557-00	250 k (B), variable (VOLUME control)

SWITCHES

S1	1-516-040-31	rotary/slide (FUNCTION)
S2	1-516-030-00	slide (MODE)
S3	1-514-923-00	push; 3-key (MODE and MONITOR)
S4	1-516-023-00	seesaw (POWER); Canada Model
	1-514-817-41	seesaw (POWER); General Export and AEP Model
S5	1-514-478-00	slide (CARTRIDGE SELECTOR)
S6	1-514-923-00	push; 3-key (LOUDNESS)
S7	1-514-290-00	push (AFC)
S8	1-514-290-00	push (SPEAKER)

FILTERS

CF201	1-403-562-11	fm i-f, ceramic 10.70 MHz (red)
CF202	1-403-562-31	fm i-f, ceramic 10.74 MHz (white)
	1-403-562-51	fm i-f, ceramic 10.78 MHz (yellow)

MISCELLANEOUS

CP801	1-231-057-12	encapsulated component, 120 Ω + 0.033 μF (General Export and CANADA Model only)
CR201	1-231-175-00	encapsulated component, 4.7 kΩ + 150 pF
J104, 105 J204, 205	1-507-163-00	phono jack, 4-p
J101, 102 J103, 201 J202, 203	1-507-185-00	phono jack, 6-p
J107	1-507-310-00	jack, HEADPHONE
CNJ1	1-509-359-00	REC/PB connector (General Export and AEP Model only)
CNJ2	1-509-403-00	AC outlet (General Export and CANADA Model only)
CNJ3	1-509-445-00	AC input connector (AEP Model only)
	1-517-050-00	socket, dial lamp
PL1	1-518-051-13	lamp, stereo 4.5 V/40 mA
PL2, 3, 4	1-518-070-00	lamp, dial 8 V/0.3A
M	1-520-102-00	meter, TUNER INPUT
VS	1-509-385-00	voltage changeover block (AEP Model only)
VS	1-526-165-21	voltage changeover block (General Export Model only)
F4	1-532-053-00	fuse, 1.6A (AEP Model only)
F2, 3	1-532-203-00	fuse, 2AT (AEP Model only)
F1	1-532-259-00	fuse, 1.6AT (AEP Model only)
	1-532-266-00	fuse 1.2A (General Export and Canada Model)
	1-533-069-00	holder, fuse (AEP Model only)
	1-534-526-00	cord, power (CANADA Model)
	1-534-551-00	cord, power (General Export Model)
	1-536-187-00	terminal strip, L1 (AEP Model only)
	1-536-286-00	terminal strip, 4-p (ANTENNA)
	1-581-271-00	board, 4-p phono jack

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